

STAFF SUMMARY FOR FEBRUARY 21, 2020

20. PETITIONS FOR REGULATORY CHANGE**Today's Item****Information** ☐**Action** ☒

This is a standing agenda item for FGC to act on regulation petitions from the public that are marine in nature. For this meeting:

- (A) Action on current petitions received at the Dec 2019 meeting
- (B) Pending regulation petitions referred to DFW for review

Summary of Previous/Future Actions

- | | |
|--------------------------------------|---------------------------------|
| (A) | |
| • FGC received petitions | Dec 11-12, 2019; Sacramento |
| • Today's action on petitions | Feb 21, 2020; Sacramento |
| (B) | |
| • FGC received petition #2019-012 | Jun 12-13, 2019; Redding |
| • FGC received petition #2019-014 | Aug 7-8, 2019; Sacramento |
| • Petition #2019-012 referred to DFW | Aug 7-8, 2019; Sacramento |
| • Petition #2019-014 referred to DFW | Oct 9-10, 2019; Valley Center |
| • Today's action on petitions | Feb 21, 2020; Sacramento |

Background

Pursuant to Section 662, any request for FGC to adopt, amend, or repeal a regulation must be submitted on form FGC 1, "Petition to the California Fish and Game Commission for Regulation Change." Petitions received at an FGC meeting are scheduled for consideration at the next business meeting under (A), unless the petition is rejected under 10-day staff review as prescribed in subsection 662(b). A petition may be (1) denied, (2) granted, or (3) referred to committee, staff or DFW for further evaluation or information-gathering. Referred petitions are scheduled for action under (B) once the evaluation is completed and a recommendation made.

- (A) ***Petitions for regulation change.*** Five petitions from Dec 2019 are scheduled for action:
- I. Petition #2019-022: *Increase shoreside possession limits to more than one daily recreational bag limit for multi-day fishing trips* (Exhibit A2)
 - II. Petition #2019-023 AM 1: *Authorize hunting of ravens* (Exhibit A3)
 - III. Petition #2019-024 AM 1: *Authorize hunting of blackbirds, cowbirds, grackles, crows, and magpies* (Exhibit A4)
 - IV. Petition #2019-025: *Consider non-lethal beaver deterrence and listed species impacts prior to issuing depredation permits* (Exhibit A5)
 - V. Petition #2019-026: *Reduce recreational trout bag limit for Caples Creek* (Exhibit A6)

Staff recommendations and rationales are provided in Exhibit A1.

- (B) ***Pending regulation petitions.*** This is an opportunity for staff to provide recommendation on petitions previously referred by FGC to staff, DFW, or committee for review.

STAFF SUMMARY FOR FEBRUARY 21, 2020

Two petitions previously referred to DFW are scheduled for action today. DFW has completed its review and prepared recommendations for the following:

- I. Petition #2019-012: *Prohibit hand operated water pumps for take of gaper and other clams* (Exhibit B2)
- II. Petition #2019-014: *Increase restrictions on recreational take of California grunion* (Exhibit B3)

Staff recommendations and rationales are provided in Exhibit B1. DFW's review and recommendations are provided in exhibits B4 and B5.

Significant Public Comments

1. A commenter on petitions #2019-023 and #2019-024 laments the loss of birds over the past 20 years and notes the effects of the Tubbs Fire on birds (Exhibit A7).
2. A commenter writes in support of petition #2019-024, noting that the birds can be a nuisance, cowbirds are an invasive species, and allowing hunting may provide a source of game meat (Exhibit A8). Another commenter makes similar points with respect to ravens and petition #2019-023 (Exhibit A9).
3. A commenter on petition #2019-012 supports measures to curb clamming with pumps, and provides four options: prohibit the use of pumps, lower the daily bag limit, institute seasonal closures, or disallow the activity (Exhibit B6).

Recommendation

FGC staff: Adopt the staff recommendations as reflected in exhibits A1 and B1. Approve DFW recommendation to refer subject matter of petition #2019-014 concerning California grunion to MRC.

DFW: Grant referred petition #2019-012 for consideration. Grant referred petition #2019-014, and refer the subject matter (California grunion) to the MRC for a DFW presentation and discussion in Jul 2020 on possible regulation changes for the recreational fishery.

Exhibits

- A1. [Table of petitions for regulation change, updated Feb 14, 2020](#)
- A2. [Petition #2019-022, received Oct 21, 2019](#)
- A3. [Petition #2019-023 AM 1, received Nov 8, 2019](#)
- A4. [Petition #2019-024 AM 1, received Nov 8, 2019](#)
- A5. [Petition #2019-025, received Nov 15, 2019](#)
- A6. [Petition #2019-026, received Nov 22, 2019](#)
- A7. [Email from Jane, received Jan 30, 2020](#)
- A8. [Email from Kara Norris, received Feb 2, 2020](#)
- A9. [Email from Nathaniel Norris, received Feb 2, 2020](#)
- B1. [Table of referred petitions for regulation change, updated Feb 14, 2020](#)
- B2. [Petition #2019-012, received May 30, 2019](#)
- B3. [Petition #2019-014, received Jun 20, 2019](#)

STAFF SUMMARY FOR FEBRUARY 21, 2020

- B4. [DFW memo regarding review of petition #2019-012, received Jan 24, 2020](#)
- B5. [DFW memo regarding review of petition #2019-014, received Jan 9, 2020](#)
- B6. [Letter from Scott Miller, received Feb 8, 2020](#)

Motion/Direction

Moved by _____ and seconded by _____ that the Commission adopts the staff recommendations as reflected in exhibits A1 and B1 and refers California grunion recreational fishery management to the Marine Resources Committee for discussion at a future meeting.

OR

Moved by _____ and seconded by _____ that the Commission adopts the staff recommendations as reflected in exhibit A1 and B1, except for petition(s) #_____ for which the action is _____, and refers California grunion recreational fishery management to the Marine Resources Committee for discussion at a future meeting.

CALIFORNIA FISH AND GAME COMMISSION PETITIONS FOR REGULATION CHANGE - ACTION

Revised 2/14/2020

FGC - California Fish and Game Commission DFW - California Department of Fish and Wildlife WRC - Wildlife Resources Committee MRC - Marine Resources Committee

Grant: FGC is willing to consider the petitioned action through a process Deny: FGC is not willing to consider the petitioned action Refer: FGC needs more information before deciding whether to grant or deny

Tracking No.	Date Received	Name of Petitioner	Subject of Request	Short Description	FGC Receipt Scheduled	FGC Action Scheduled	Staff Recommendation	Marine or Wildlife?
2019-022	10/21/2019	Tony Barcellos	Multi-day fishing trip	Request to change section 27.15 to say "as long as each person didn't catch over [their] daily limit came in to dock [fillet their] fish and placed it on ice in a cooler, then person would not be in violation for over limit"	12/11-12/2019	2/21/2020	DENY; Allowing a person to possess more than one daily bag limit would create significant enforcement challenges, such as how to determine when and how many fish were taken by a person in possession of multiple limits of fish.	Marine
2019-023	10/25/2019	Karl Gene Kerster	Allow raven hunting	Add ravens to crows to hunt them both for the same season. Change "\$485. American Crow." to read "\$485. American Crow and Raven."	12/11-12/2019	2/21/2020	DENY; With the exception of American Crow, no federal regulations allow the hunting of these bird species. 50 CFR 21.43 allows take of these species when the are causing damage to crops or other property only.	Wildlife
2019-024	10/25/2019	Karl Gene Kerster	Allow hunting of certain birds	Add hunting of blackbirds, cowbirds, grackles, crows, and magpies.	12/11-12/2019	2/21/2020	DENY; With the exception of American Crow, no federal regulations allow the hunting of these bird species. 50 CFR 21.43 allows take of these species when the are causing damage to crops or other property only. Crow hunting is currently permitted in California.	Wildlife
2019-025	11/15/2019	Thomas Wheeler	Consider non-lethal beaver deterrence and listed species impacts in depredation permit issuance	Propose changing the regulations concerning the take of beavers by requiring landowners to exhaust feasible non-lethal deterrence before killing and removing beavers, and require DFW to consider of impacts to listed species from issuance of a depredation permit.	12/11-12/2019	2/21/2020	REFER to DFW for review and recommendation.	Wildlife
2019-026 AM 1	11/22/2019	Stanley Backlund	Caples Creek trout bag limits	Revise the bag limit for fishing on Caples Creek in El Dorado County to apply the winter regulations year round, thereby reducing the summer take from five fish to zero fish.	12/11-12/2019	2/21/2020	DENY; this area is already under consideration in the draft simplification of statewide inland sport fishing regulations rulemaking under WRC review. Petitioner has been referred to that process.	Wildlife



Tracking Number: 2019-022

To request a change to regulations under the authority of the California Fish and Game Commission (Commission), you are required to submit this completed form to: California Fish and Game Commission, 1416 Ninth Street, Suite 1320, Sacramento, CA 95814 or via email to FGC@fgc.ca.gov. Note: This form is not intended for listing petitions for threatened or endangered species (see Section 670.1 of Title 14).

Incomplete forms will not be accepted. A petition is incomplete if it is not submitted on this form or fails to contain necessary information in each of the required categories listed on this form (Section I). A petition will be rejected if it does not pertain to issues under the Commission's authority. A petition may be denied if any petition requesting a functionally equivalent regulation change was considered within the previous 12 months and no information or data is being submitted beyond what was previously submitted. If you need help with this form, please contact Commission staff at (916) 653-4899 or FGC@fgc.ca.gov.

SECTION I: Required Information.

Please be succinct. Responses for Section I should not exceed five pages

1. Person or organization requesting the change (Required)

Name of primary contact person: TONY Brasil Barcellos

Address: _____

Telephone number: _____

Email address: N/A

2. Rulemaking Authority (Required) - Reference to the statutory or constitutional authority of the Commission to take the action requested: Section 1.17, 200, 205, 265 Fish and Game Code and Section 27.15, 200, 205, 209, 265, 275 Fish and Game Code

3. Overview (Required) - Summarize the proposed changes to regulations: I'd like the Fish and Game Commission to change Section 27.15 Multi day fishing trips to as long as each person didn't catch over his daily limit, come in to dock filled his fish and placed it on ice in a cooler the person would not be in violation for over limits.

4. Rationale (Required) - Describe the problem and the reason for the proposed change: The problem is as I explained in my letter dated July 3, 2019. Because we live over one hundred miles from the Ocean we would like to fish for more than one day, come in to dock, and stay for the next day.



SECTION II: Optional Information

5. **Date of Petition:** Oct. 15, 2019
6. **Category of Proposed Change**
☐ Sport Fishing
☐ Commercial Fishing
☐ Hunting
☐ Other, please specify: _____
7. **The proposal is to:** (To determine section number(s), see current year regulation booklet or <https://govt.westlaw.com/calregs>)
☒ Amend Title 14 Section(s): _____
☐ Add New Title 14 Section(s): _____
☐ Repeal Title 14 Section(s): _____
8. **If the proposal is related to a previously submitted petition that was rejected, specify the tracking number of the previously submitted petition** _____
Or ☐ Not applicable.
9. **Effective date:** If applicable, identify the desired effective date of the regulation.
If the proposed change requires immediate implementation, explain the nature of the emergency: The desired date for the change on the regulation would be for the year 2020-2021.
10. **Supporting documentation:** Identify and attach to the petition any information supporting the proposal including data, reports and other documents: I'm attaching a copy of my letter dated July 3, 2019 addressed to The California Fish and Game Commission.
11. **Economic or Fiscal Impacts:** Identify any known impacts of the proposed regulation change on revenues to the California Department of Fish and Wildlife, individuals, businesses, jobs, other state agencies, local agencies, schools, or housing: _____
12. **Forms:** If applicable, list any forms to be created, amended or repealed: _____



RECEIVED
FISH AND GAME
COMMISSION

2019 OCT 21 PM 1:3

SECTION 3: FGC Staff Only

Date received: _____

FGC staff action:

- ☐ Accept - complete
- ☐ Reject - incomplete
- ☐ Reject - outside scope of FGC authority

Date petitioner was notified of receipt of petition and pending action: _____

Meeting date for FGC consideration: _____

FGC action:

- ☐ Denied by FGC
- ☐ Denied - same as petition: _____
Tracking Number
- ☐ Granted for consideration of regulation change

July 3, 2019
Tony & Elvis Barcellos

To the California Fish And Game Commission.

My Son Elvis, and I went fishing off Morro Bay Harbor December 28, 2018 thru December 30, 2018. On December 28, we each caught 9 rockfish, we filleted the fish, and placed the fish in a ziplock bag then placed the fish on ice in the cooler in the truck.

On December 29, we went out fishing again, we each caught 9 rockfish, and 1 legal lingcod, and repeated the same process as on the previous day. On December 30, went out fishing again and we each caught 10 rockfish and 4 legal lingcod. On this day a fish and game warden, asked my son Elvis if we had any fish in the truck, my son told him yes, from the previous two days. We told the warden we lived over one hundred miles from Morro Bay, and that the way we read the regulations on the book, that the over limits pertained to in the boat.

The warden decided to write each one of us a citation. I would like to ask the Commission to consider changing 14CCR 27.15. Multi-Day Fishing Trips, to allow keeping the fish for each separate day as long as one didn't catch over the legal limit for each day, I would appreciate your consideration, and your correspondence.

Sincerely Yours
Tony Barcellos



Tracking Number: (2019-023)

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Incomplete forms will not be accepted. A petition is incomplete if it is not submitted on this form or fails to contain necessary information in each of the required categories listed on this form (Section I). A petition will be rejected if it does not pertain to issues under the Commission's authority. A petition may be denied if any petition requesting a functionally equivalent regulation change was considered within the previous 12 months and no information or data is being submitted beyond what was previously submitted. If you need help with this form, please contact Commission staff at (916) 653-4899 or FGC@fgc.ca.gov.

SECTION I: Required Information.

Please be succinct. Responses for Section I should not exceed five pages

1. Person or organization requesting the change (Required)

Name of primary contact person: Karl Gene Kerster

Address: [REDACTED]

Telephone number: [REDACTED]

Email address: [REDACTED]

2. Rulemaking Authority (Required) - Reference to the statutory or constitutional authority of the Commission to take the action requested: Title 14

3. Overview (Required) - Summarize the proposed changes to regulations: Add ravens to crows to hunt them both for the same season. Change §485. American Crow. To read §485. American Crow And Raven

4. Rationale (Required) - Describe the problem and the reason for the proposed change: Ravens can be highly destructive to native wildlife including, but not limited to desert tortoises, and ducks. Adding ravens to the crow season would or could facilitate a significant, cost-effective method to use hunters and hunting to manage ravens as needed in a non-political and nimble way. Additionally, it would make moot any concern of ravens being incorrectly identified as crow, by people who are hunting crows, because it would be permissible to hunt either species. Raven breast is exceptional fair on the grill on a par with sandhill crane.

SECTION II: Optional Information

5. Date of Petition: 10/24/2019

6. Category of Proposed Change

☐ Sport Fishing



- ☐ Commercial Fishing
☒ Hunting
☐ Other, please specify:

7. **The proposal is to:** (*To determine section number(s), see current year regulation booklet or <https://govt.westlaw.com/calregs>*)
☒ Amend Title 14 Section(s) §485. American Crow.
☐ Add New Title 14 Section(s):
☐ Repeal Title 14 Section(s):
8. **If the proposal is related to a previously submitted petition that was rejected, specify the tracking number of the previously submitted petition**
Or ☒ Not applicable.
9. **Effective date:** If applicable, identify the desired effective date of the regulation.
If the proposed change requires immediate implementation, explain the nature of the emergency: July 1, 2020
10. **Supporting documentation:** Identify and attach to the petition any information supporting the proposal including data, reports and other documents:
11. **Economic or Fiscal Impacts:** Identify any known impacts of the proposed regulation change on revenues to the California Department of Fish and Wildlife, individuals, businesses, jobs, other state agencies, local agencies, schools, or housing: This proposal, if enacted, could solve a management problem dealing with ravens without any cost to the CDFW. Hunters would have the pleasure of eating these large and tasty birds.
12. **Forms:** If applicable, list any forms to be created, amended or repealed:

SECTION 3: FGC Staff Only

Date received: [Received by email on Friday, October 25, 2019 at 9:52 AM.](#)

FGC staff action:

- ☐ Accept - complete
☐ Reject - incomplete
☐ Reject - outside scope of FGC authority

Tracking Number 2019-023

Date petitioner was notified of receipt of petition and pending action: _____

Meeting date for FGC consideration: _____

FGC action:

- ☐ Denied by FGC
☐ Denied - same as petition _____

Tracking Number



State of California – Fish and Game Commission

PETITION TO THE CALIFORNIA FISH AND GAME COMMISSION FOR REGULATION CHANGE

FGC 1 (Rev 06/19) Page 3 of 3

☐ Granted for consideration of regulation change

From: FGC
Sent: Friday, November 8, 2019 2:25 PM
To: Kinchak, Sergey@FGC
Cc: Cornman, Ari@FGC
Subject: Fw: Addendum to petitions from Karl G Kerster

From: Karl Kerster [REDACTED]
Sent: Friday, November 8, 2019 11:26 AM
To: FGC <FGC@fgc.ca.gov>
Subject: Addendum to petitions from Karl G Kerster

In regard to the two petitions I submitted recently:
I request to waive time requirements for both petitions.
I appear to have submitted incomplete documentation regarding the
Rulemaking Authority section.

For the Raven/Crow petition please include: Authority cited: Sections 355, 356, 3004.5 and 3800, Fish and Game Code. Reference: Sections 355, 356, 3004.5 and 3800, Fish and Game Code.

For the depredation species petition please include:

Authority cited: Sections 200, 265, 1050, 3960.2, 4150, 4181 and 4181.5, Fish and Game Code.
Reference: Sections 3003.1, 3960, 3960.2, 4150, 4152, 4181 and 4181.5, Fish and Game Code.

Thank you,
Karl Gene Kerster



Tracking Number: (2019-024)

To request a change to regulations under the authority of the California Fish and Game Commission (Commission), you are required to submit this completed form to: California Fish and Game Commission, (physical address) 1416 Ninth Street, Suite 1320, Sacramento, CA 95814, (mailing address) P.O. Box 944209, Sacramento, CA 94244-2090 or via email to FGC@fgc.ca.gov. Note: This form is not intended for listing petitions for threatened or endangered species (see Section 670.1 of Title 14).

Incomplete forms will not be accepted. A petition is incomplete if it is not submitted on this form or fails to contain necessary information in each of the required categories listed on this form (Section I). A petition will be rejected if it does not pertain to issues under the Commission's authority. A petition may be denied if any petition requesting a functionally equivalent regulation change was considered within the previous 12 months and no information or data is being submitted beyond what was previously submitted. If you need help with this form, please contact Commission staff at (916) 653-4899 or FGC@fgc.ca.gov.

SECTION I: Required Information.

Please be succinct. Responses for Section I should not exceed five pages

1. Person or organization requesting the change (Required)

Name of primary contact person: Karl Gene Kerster

Address: [REDACTED]

Telephone number: [REDACTED]

Email address: [REDACTED]

2. Rulemaking Authority (Required) - Reference to the statutory or constitutional authority of the Commission to take the action requested: Title 14

3. Overview (Required) - Summarize the proposed changes to regulations: Add hunting of all birds that are listed for federal standing order of depredation.

4. Rationale (Required) - Describe the problem and the reason for the proposed change: Federal depredation order § 50CFR21.43: § 21.43 Depredation order for blackbirds, cowbirds, grackles, crows and magpies. These birds should be legal for hunters to intentionally hunt since they are killed anyways.

SECTION II: Optional Information

5. Date of Petition: 10/24/2019

6. Category of Proposed Change

☐ Sport Fishing

☐ Commercial Fishing

☒ Hunting

☐ Other, please specify:



7. **The proposal is to:** (*To determine section number(s), see current year regulation booklet or <https://govt.westlaw.com/calregs>*)
- ☐ Amend Title 14 Section(s):
- ☒ Add New Title 14 Section(s): Hunt birds that are currently under depredation orders
- ☐ Repeal Title 14 Section(s):
8. **If the proposal is related to a previously submitted petition that was rejected, specify the tracking number of the previously submitted petition**
Or ☒ Not applicable.
9. **Effective date:** If applicable, identify the desired effective date of the regulation.
If the proposed change requires immediate implementation, explain the nature of the emergency: 07/01/2020
10. **Supporting documentation:** Identify and attach to the petition any information supporting the proposal including data, reports and other documents: § 21.43 Depredation order for blackbirds, cowbirds, grackles, crows and magpies. A Federal permit shall not be required to control yellow-headed redwinged, rusty, and Brewer's blackbirds, cowbirds, all grackles, crows, and magpies, when found committing or about to commit depredations upon ornamental or shade trees, agricultural crops, livestock, or wildlife, or when concentrated in such numbers and manner as to constitute a health hazard or other nuisance: Provided: (a) That none of the birds killed pursuant to this section, nor their plumage, shall be sold or offered for sale, but may be possessed, transported, and otherwise disposed of or utilized.
11. **Economic or Fiscal Impacts:** Identify any known impacts of the proposed regulation change on revenues to the California Department of Fish and Wildlife, individuals, businesses, jobs, other state agencies, local agencies, schools, or housing: Cost savings for the CDFW. Sporting opportunities for hunters.
12. **Forms:** If applicable, list any forms to be created, amended or repealed:

SECTION 3: FGC Staff Only

Date received: [Received by email on Friday, October 25, 2019 at 9:52 AM.](#)

FGC staff action:

- ☐ Accept - complete
- ☐ Reject - incomplete
- ☐ Reject - outside scope of FGC authority

Tracking Number 2019-024

Date petitioner was notified of receipt of petition and pending action: _____

Meeting date for FGC consideration: _____

FGC action:

- ☐ Denied by FGC



State of California – Fish and Game Commission

PETITION TO THE CALIFORNIA FISH AND GAME COMMISSION FOR REGULATION CHANGE

FGC 1 (Rev 06/19) Page 3 of 3

☐ Denied - same as petition _____

Tracking Number

☐ Granted for consideration of regulation change

From: FGC
Sent: Friday, November 8, 2019 2:25 PM
To: Kinchak, Sergey@FGC
Cc: Cornman, Ari@FGC
Subject: Fw: Addendum to petitions from Karl G Kerster

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For the depredation species petition please include:

Authority cited: Sections 200, 265, 1050, 3960.2, 4150, 4181 and 4181.5, Fish and Game Code.
Reference: Sections 3003.1, 3960, 3960.2, 4150, 4152, 4181 and 4181.5, Fish and Game Code.

Thank you,
Karl Gene Kerster



Tracking Number: (2019-025)

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SECTION I: Required Information.

Please be succinct. Responses for Section I should not exceed five pages

1. Person or organization requesting the change (Required)

Name of primary contact person: Thomas Wheeler, Environmental Protection Information Center (EPIC)
Address: 145 G St., Ste. A, Arcata, CA 95521
Telephone number: (707) 822-7711
Email address: tom@wilcalifornia.org

Additional Co-Petitioners: Center for Biological Diversity, Occidental Arts and Ecology Center, Northcoast Environmental Center, Safe Alternatives for our Forest Environment,

2. Rulemaking Authority (Required) - Reference to the statutory or constitutional authority of the Commission to take the action requested: FGC 200, 203, 1050, 4009.5, 4180, 4181

3. Overview (Required) - Summarize the proposed changes to regulations:

Petitioners propose changing the regulations concerning the taking of beaver in the state to better reflect the beaver's unique ecological importance by clarifying the circumstances under which the California Department of Fish and Wildlife may issue a depredation permit for beavers. The proposed changes would require landowners to exhaust feasible non-lethal deterrence before killing and removing beavers, and require the Department to consider impacts to listed species from issuance of a depredation permit. The suggested changes not only better recognize the unique and valuable role beavers play in aquatic ecosystems, but also helps to shield the state against litigation and better aligns California's rules with those of other states.

Amend 14 CCR 401

§ 401. Issuance of Permit to Take Animals Causing Damage.

(a) Application. A person who is a property owner or tenant may apply to the department for a permit to take elk, bear, bobcat, beaver, wild pigs, deer, wild turkeys, or gray squirrels that are damaging or



destroying, or immediately threatening to damage or destroy, land or property. A bobcat in the act of injuring or killing livestock may be taken immediately provided the property owner or tenant applies for a permit from the department the next working day following the take.

(b) Permit Period.

(1) Permits issued pursuant to this section for beaver, wild pigs, or gray squirrels shall be valid for a period not to exceed one year.

(2) Permits issued pursuant to this section for bobcat, elk, bear, wild turkey, or deer shall be valid for a period not to exceed 60 consecutive days.

(3) Permits issued pursuant to this section authorizing the use of dogs for bear or bobcat shall authorize no more than three dogs and shall be valid for a period not to exceed 20 consecutive days.

(4) Permits may be renewed if damage or threatened damage to land or property continues to exist.

(c) Required Information and Conditions of Permit.

(1) The department shall collect the following information before issuing a depredation permit:

(A) The name, mailing address, and contact information of the property owner, including telephone, facsimile, and email. If the owner is a business entity, contact information for the person acting on behalf of the business.

(B) The name, mailing address, and contact information of the tenant (if applicable), including telephone, facsimile, and email.

(C) The name, mailing address, and contact information of any dog handlers or agents as described in subdivision (e), including telephone, facsimile, and email.

(D) The county and address of the location of the damage caused by depredation, or the nearest landmark or cross streets.

(E) A full description of the land or property damaged, destroyed, or immediately threatened, and the date the damage or threat occurred.

(F) The species suspected of damaging, destroying, or threatening land or property, and the method of identifying the species.

(G) A description of all non-lethal or less-lethal measures undertaken to prevent damage caused by animals prior to requesting the permit.

(H) A description of corrective actions that will be implemented to prevent future occurrence of the damage.

(I) The proposed method of take.

(J) Whether dogs will be used to pursue or take the animal, and if so, why dogs are needed, and the number of dogs to be used.

(2) The department may add terms and conditions to the permit necessary to protect wildlife and ensure public safety. To be valid, the permit shall contain a statement signed by the applicant that he/she has read, understands, and agrees to be bound by all the terms of the permit.

(3) The department may not issue any permit that would authorize activities that would violate federal, state or local law.

(4) For the taking of beaver, the department may issue a permit only if the department finds that the applicant has used at least one non-lethal deterrence or mitigation method prior to issuance of the permit, unless the department finds that exigent circumstances, such as a risk to human safety, require immediate lethal action. Non-lethal methods include, but are not limited to, wrapping trees, fencing, flow control devices, and other beaver deterrence. If the permit would remove beaver or their dams in areas occupied by endangered or threatened salmonids or other state or federally-listed species dependent on freshwater habitats maintained by beaver, the department shall analyze impacts to such species, document its findings in a report to accompany the permit, and include mitigation measures to eliminate harm to such species.

(d) Methods of Take.



(1) Animals taken pursuant to a permit may be taken in any legal manner except as herein provided and in accordance with the provisions of Section 465.5 of these regulations. Permits to take deer shall include conditions that comply with Fish and Game Code section 4181.5. Permits to take bear and bobcat with dogs shall include conditions that comply with Fish and Game Code Section 3960.2. No steel-jawed leghold traps may be used to take mammals, and no iron-jawed or any type of metal-jawed traps may be used to take squirrels or bears. No poison may be used. The department may specify the caliber and type of firearm and ammunition, archery equipment or crossbow to be used. The department may require that a permittee take animals alive by the use of live traps.

(2) The permittee and/or agent shall ensure that all animals are killed in a humane manner instantly and prevent any injured animal from escaping.

(e) Government Employees and Designated Agents.

(1) An employee of a federal, State, or local government agency or local district with responsibilities including but not limited to animal control, animal damage control, irrigation, flood, or natural resource reclamation, while acting in his/her official capacity may take depredating animals on the property designated in a permit issued pursuant to this section.

(2) The permittee may designate up to three other persons, including any dog handler who will be utilized in any pursuit, as his/her agents to take animals under the terms of the permit. A designated agent shall be any person who is acting under the direction and control of the permittee and who is 21 years of age or older. The designated agent(s) shall be named on the permit. The permittee may substitute designated agents with prior written approval of the department.

(f) Persons Prohibited from Taking Animals. No person shall take animals pursuant to the permit if he/she has been convicted of a violation related to the take or possession of game or furbearing mammals in the past 24 months or if he/she is on probation and may not hunt or possess a firearm as part of the terms of probation. A landowner who is on probation and may not hunt or possess a firearm as part of the terms of probation shall designate a qualified agent to take animals under a permit.

(g) Reports Required.

(1) Holders of permits authorizing take of wild pigs shall provide a report listing the date and sex of each wild pig taken. A report shall be submitted whether or not any animals were taken. The reporting period shall be by calendar month. The permittee or designated agent shall complete and submit the report to the department on or before the 15th day of the following month. Reports shall be submitted to the address provided by the department.

(2) Holders of permits authorizing the use of dogs to take bear or bobcat shall comply with the requirements of Fish & Game Code section 3960.2 and shall submit a report to the department within 30 days of permit issuance. Reports shall be submitted to the address provided by the department. Reports shall include the following information:

(A) Date of kill and the sex of any bear or bobcat that was killed.

(B) Details regarding all pursuits, including any information about a pursued bear or bobcat, even if the animal was not killed.

(C) An explanation of why any pursued bear or bobcat was not killed, and whether such bear or bobcat was harmed.

(3) Holder of permits authoring take of beavers shall provide a report documenting whether associated natural structures, such as beaver dams, were removed, destroyed, or otherwise altered.

(h) Tagging Animals. All animals taken pursuant to a permit, except wild pigs, shall be immediately tagged with tags provided by the department. Wild pigs shall be tagged prior to being transported from the property designated in the permit. Tags for animals except wild pigs shall be completed at the time the animal is taken. Tags for wild pigs shall be completed before the wild pigs are removed from the property. Tags shall clearly show the permittee's name, address, date and location the animal was taken and shall include the signature of the person taking the animal. The report portion of each tag shall be



mailed to the department without delay. No tags are required for squirrels or beavers.

(i) Utilization of Carcass. Animals taken pursuant to this permit must be disposed of as required in the permit. No animals, except wild pigs, may be utilized by the permittee or designated agent. The permittee or designated agent may leave the carcass of any wild pig where it was taken for reasons of high air temperatures, disease, parasites, or conditions which preclude use of the carcass. A person who makes every reasonable attempt to utilize the carcass of any wild pig as required in this subsection shall be deemed to be in compliance with Section 4304 of the Fish and Game Code. (1) After any taking of bear, the permittee or agent shall comply with Section 367.5 of these regulations, except the skull shall not be returned to the permittee or agent.

(j) Suspension and Revocation of Permits.

(1) Permits may be suspended temporarily by the director for a breach or violation of the permit by the holders thereof, their agents, servants, employees or any person acting under their direction and control. The commission shall be notified of any such suspension and subsequently may revoke or reinstate the permit, or fix the period of its suspension, after written notice to the permittee and the permittee has been afforded an opportunity to be heard.

(2) Any person who has had his/her permit revoked or suspended by the commission shall be required, upon application for a new or subsequent permit, to appear before the commission and demonstrate to its satisfaction that the use of such a permit will be consistent with depredation control, with these regulations, and with the laws under which they are promulgated.

(k) It is unlawful for a permittee or agent to violate any of the terms or conditions of a permit issued pursuant to this section.

(l) The permit does not invalidate any city, county, or state firearm regulation.

4. Rationale (Required) - Describe the problem and the reason for the proposed change:

The North American beaver (*Castor canadensis*) is native to California. Accordingly, the flora and fauna of the state have co-evolved with the beaver, developing unique and complex interwoven relationships. Beavers, however, are currently missing from much of their historic range and the effects of their absence are felt by the species that co-evolved with beavers. Beaver create freshwater habitats used by a variety of wildlife, including fish, birds, and other mammals. Their dams filter stream water, improve water quality, raise the water table, increase water storage, and repair eroded riparian areas. In particular, beavers have a significant beneficial relationship to many species currently listed as threatened or endangered under the California Endangered Species Act and/or the federal Endangered Species Act, such as coho salmon. The proposed amendments to the regulations recognize the unique ecological importance of beavers and take steps towards promoting our co-existence with beavers by prohibiting the commercial trapping of beavers, and by requiring that non-lethal or less-lethal measures have been taken to avoid and minimize conflicts with humans. The proposed regulations are in line with how many other states now manage beavers.

Beavers are Biologically Important to California

Beavers are native to much of California, from arid desert streams, to high mountain meadows, to coastal forests. California's beavers were nearly extirpated from the state by over trapping. Although some attempts have been made to reintroduce beavers or assist in their dispersal, beavers remain missing from much of their historic territory, in particular northern California coastal streams and high mountain meadows where the benefits of beavers may be most acutely felt.



The total impact of beavers to the hydrologic characteristics of streams is difficult to overestimate. Beaver dams increase in-stream storage capacity, which in turn has been shown to result in greater summer flows, even going so far as to result in continual flow in previously seasonal streams. Impoundment of water also has been shown to stabilize water temperatures. Beaver dams slow stream flow resulting in increased sedimentation, thereby raising incised channels to the point where streams are reconnected to their historic floodplains.

Beaver dams are so ecologically important that watershed restoration groups are now turning to “beaver dam analogs,” human engineered approximations of beaver dams, to provide the same ecological functions. Unlike beaver dams, continual human maintenance—and cost—is required.

Broadly, the presence of beaver has been shown to increase bird, fish, invertebrate, amphibian and mammalian abundance and diversity. Turning specifically to native fish species, the overall net effect of beavers is positive, as many of these hydrologic changes associated with beaver dams benefit fish. Over 80 species of North American fish have been documented using beaver ponds; 48 of which commonly use beaver pond habitats. The slow current and large surface to edge ratio has been shown to increase vegetation and aquatic invertebrates, providing substantially improved forage compared to unimpounded streams. The slow current also requires less expense of energy for fish. Turning specifically to coho salmon, the effects of these changes are perhaps most pronounced. For overwinter use, coho salmon use side channel habitat influenced by beaver dams at a higher density, and were larger and had a better juvenile survival rate than juvenile salmon in side channels not impacted by beavers. Similarly, beaver dams are important during the summer, as are salmon who were found upstream of beaver dam were not only consistently larger, but also occurred there in higher densities. One study found, for example, that though these upstream reaches accounted for less than 1% of the total available habitat, these dam-influenced areas contained over a third of the total juvenile salmon for the entire watercourse.

Beavers also have been shown to have positive benefits to other species. Beaver dams are associated with increased riparian habitat, such as willow. This willow serves as important habitat for the southwestern willow flycatcher (*Empidonax traillii extimus*) and least Bell’s vireo (*Vireo bellii pusillus*). Tidewater goby (*Eucyclogobius newberryi*), listed as “endangered” under the Endangered Species Act, has been shown to utilize both inundated areas behind beaver dams and bank burrows made by beavers. (USFWS 2005). Beaver dams are thought to provide important refugia for endangered California red-legged frogs (*Rana draytonii*) and western pond turtles (*Actinemys marmorata*), a “species of special conservation concern” in California.

New Regulations Pose Minimal Hardship for Landowners

In some places, beavers can conflict with human uses of the landscape, as dams can cause flooding for adjacent lands. Additionally, beavers may remove some riparian vegetation or may alter the structure or composition of riparian areas in a way that is undesirable to a landowner. As the rules are currently written, it is too easy to obtain a permit to take beaver through a depredation permit, thereby discouraging non-lethal deterrence. The proposed rulemaking would not prohibit lethal removal of beavers but it would ensure that beavers are taken (killed) only when necessary, after non-lethal measures have been attempted. Further, the rules would still allow for the lethal removal of beaver if exigent circumstances require their removal.

Coexistence with beavers is often possible with minimal effort by landowners. Many beavers are removed because of the dams that they produce impound areas with water against the wishes of property



owners. A variety of devices and techniques have been developed to reduce impoundment and flooding. Beavers are also taken because of impacts to vegetation adjacent to waterways. This vegetation can easily be protected with hardware cloth or welded wire mesh wrapped around the base of the tree. The Department maintains a guide on “Living with Beavers,” which is attached to this petition, that discusses many of the ways humans can co-exist with beavers.

Proposed Regulations Insulate State Against Litigation

The proposed rulemaking also insulates the Department against potential litigation under the Endangered Species Act (ESA). In issuing permits to allow the taking of beavers, the Department may violate the ESA if such taking would, in turn, take any other species subject to the Endangered Species Act’s take prohibition. By making clear that the Department is unable to authorize the taking of beavers if such taking would result in the violation of the ESA or any other law and by requiring the Department to conduct a site-specific investigation of potential impacts, the Department will avoid future litigation.

As it relates here, the ESA prohibits any person, including state and local governments, from “tak[ing] any [endangered or threatened] species within the United States or the territorial sea of the United States.” 16 U.S.C. § 1538(a) (1) (B). In addition, the ESA makes it unlawful for any person “to attempt to commit, solicit another to commit, or cause to be committed, any offense defined” in the ESA. *See* 16 U.S.C. § 1538(g). The term “‘take’ means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.” § 1532(19). In turn, “[t]ake’ is defined...in the broadest possible manner to include every conceivable way in which a person can ‘take’ or attempt to ‘take’ any fish or wildlife.” S.Rep. No. 93-307, at 7 (1973); *see also Babbitt v. Sweet Home Chapter of Communities for a Great Oregon*, 515 U.S. 687 (1995) (citing Senate and House Reports indicating that “take” is to be defined broadly). Pursuant to 16 U.S.C. § 1538(g), “It is unlawful for any person to...cause to be committed[] any offense defined in this section,” which includes the taking of a protected species. The Department, in issuing permits, is subject to the Act’s prohibition on authorizing take.

As the First Circuit Court of Appeals found in *Strahan v. Cox*, “The statute not only prohibits the acts of those parties that directly exact the taking, but also bans those acts of a third party that bring about the acts exacting a taking.” *Strahan v. Cox*, 127 F.3d 155, 163 (1st Cir. 1997) cert. den. 525 U.S. 830 (1998). This includes situations where a government authorizes another to conduct activities that would result in a violation of the act. In *Strahan*, the court found Massachusetts officials liable under the ESA for licensing commercial fishermen who employ methods known to harm listed whales.¹

The proposed regulation would make clear the Department’s obligation to deny any permit application that may cause the taking of any listed species or may otherwise cause a violation of federal, state, or local laws. Furthermore, it directs the Department to make a finding on impacts to listed species if lethal removal may adversely impair a listed species. Lastly, the proposed regulations would require a report if a beaver dam were to be removed.

Proposed Regulations are Consistent with Regulations in Other States

¹ The First Circuit is not alone. A long-line of “*Strahan-take*” cases have been upheld in courts across the country, including in California. *See Coalition for a Sustainable Delta v. McCamman*, 725 F. Supp. 2d 1162, 1167–68 (E.D. Cal. 2010) (recognizing that state regulating agencies may be held liable for take under the ESA, but holding there were disputes of material fact regarding whether the striped bass sportfishing regulations at issue caused take of listed salmonids).



In recognizing the unique biological importance of beavers and limiting their take to reduce impacts on the environment, California would join many other states who have come to recognize the importance of beaver in restoring and preserving healthy aquatic ecosystems. Massachusetts, for example, requires individuals to apply to remove beavers and limits their removal when beavers are causing material harm or when they pose a threat to human health or safety. Further, if removal of beavers, dams, or the de-watering of ponds may impact listed species, applicants have to seek other separate advance approval from the state. As another example, New York requires a site-specific consideration of local beaver populations and requires the state to inform applicants of the positive ecological benefits of beavers and alternatives to trapping prior to issuance of a depredation permit.

SECTION II: Optional Information

5. Date of Petition:

6. Category of Proposed Change

- ☐ Sport Fishing
- ☐ Commercial Fishing
- ☐ Hunting
- ☒ Other, please specify: Depredation permit issuance

7. The proposal is to: *(To determine section number(s), see current year regulation booklet or <https://govt.westlaw.com/calregs>)*

- ☒ Amend Title 14 Section(s): 401
- ☐ Add New Title 14 Section(s):
- ☐ Repeal Title 14 Section(s):

8. If the proposal is related to a previously submitted petition that was rejected, specify the tracking number of the previously submitted petition

Or ☒ Not applicable.

9. Effective date: If applicable, identify the desired effective date of the regulation. If the proposed change requires immediate implementation, explain the nature of the emergency:

10. Supporting documentation: Identify and attach to the petition any information supporting the proposal including data, reports and other documents: “Living with Beavers, produced by the California Department of Fish and Wildlife, is attached to this petition. .

11. Economic or Fiscal Impacts: Identify any known impacts of the proposed regulation change on revenues to the California Department of Fish and Wildlife, individuals, businesses, jobs, other state agencies, local agencies, schools, or housing: The state already created resources on non-lethal methods of dealing with beavers, and the costs of implementing those methods on site will be the responsibility of the applicant. The proposed regulatory changes would likely result in fewer permit applications, reducing the need for processing and oversight of permits issued by the agency. If the



agency continues to issue permits to kill beavers in areas occupied by listed species that depend upon beavers, however, more resources may be required to analyze, document, and mitigate impacts to listed species.

12. Forms: If applicable, list any forms to be created, amended or repealed:

SECTION 3: FGC Staff Only

Date received: [Received by email on Friday, November 15, 2019 at 10:51 AM.](#)

FGC staff action:

- ☐ Accept - complete
- ☐ Reject - incomplete
- ☐ Reject - outside scope of FGC authority

Tracking Number 2019-025

Date petitioner was notified of receipt of petition and pending action: _____

Meeting date for FGC consideration: _____

FGC action:

- ☐ Denied by FGC
- ☐ Denied - same as petition _____
- ☐ Granted for consideration of regulation change

Tracking Number

Living with Beavers

The American Beaver (*Castor canadensis*) is the largest living rodent in North America, with adults averaging 40 pounds in weight and measuring more than 3 feet in length, including the tail. These semi-aquatic mammals have webbed hind feet, large incisor teeth, and a broad, flat tail (Figures 1 and 2).



Figure 1. Photo by Cheryl Reynolds and courtesy of Worth A Dam

Once among the most widely distributed mammals in North America, beavers were eliminated from much of their range in the late 1800s because of unregulated trapping and loss of suitable habitat. Beaver are native to California and historically occurred along the coast, throughout the Central Valley, Colorado River basin, and into the Sierra Nevada and Cascades mountain ranges. However, by the early the 20th century their geographic range had decreased dramatically as a result of intensive fur-trapping and loss of suitable habitat caused by extensive land and water development. Between 1923 and 1950, the State of California conducted a successful reintroduction program using parachutes in some instances to plant beavers in remote mountain locations (Hensley 1946). Today, interest in beavers in California is on the rise as the benefits to fish and wildlife habitat, surface water storage and ground water recharge become more apparent during drought conditions.

Life History

Beavers are monogamous and mate for life. Females reach sexual maturity at 1.5 to 3 years of age and will typically birth 1-4 or more kits per year, depending on habitat quality and the availability of food. Beavers typically breed only once per year during the winter months, giving birth to kits in late spring, though significant variation occurs depending on latitude and climate (Baker and Hill 2003).

Beavers maintain family units which consist of an adult breeding pair, young of the year and young from the previous year. Sometimes, when habitat quality is poor or population levels are near their carrying capacity, older offspring will remain with the family unit for more than 2 years.

Beavers are strict herbivores and they generally prefer grasses, leaves, and aquatic plants such as cattails, bulrushes, and water lilies. Fermentation by special intestinal microorganisms allows beavers to digest 30 percent of the cellulose they ingest. In the fall and winter, they feed primarily on the bark and cambium of trees and shrubs. Aspen, cottonwood, willow and alder are preferred woody species in California. Beavers sometimes consume growing crops, and in some cases may travel 100 yards or more from a pond or stream to reach corn fields, soybean fields, and other growing crops. In these cases they generally cut the plants off at ground level and drag them back to the water.

Beavers do not hibernate. When the surface of the water is frozen, beavers eat bark and stems from a food “cache” they have anchored to the bottom of the waterway for the winter. They have also been seen swimming under the ice to retrieve roots and stems of aquatic plants. They are generally nocturnal, but it is not uncommon to see beavers during daylight hours, particularly in larger water bodies. They generally do not stray far from the relative safety of water.

Viewing Beavers

Look for signs of beavers during the day; look for the animals themselves before sunset or sunrise. Approach a beaver site slowly and downwind. (Beavers have poor eyesight but excellent hearing and sense of smell.) Look for a V-shaped series of ripples on the surface of calm water. A closer view with binoculars may reveal the nostrils, eyes, and ears of a beaver swimming.



Figure 2. Beaver at French Creek, Siskiyou County. Photo by M. Stapleton.

If you startle a beaver and it goes underwater, wait quietly in a secluded spot and chances are that it will reemerge within one or two minutes. However, beavers are able to remain underwater for at least 15 minutes by slowing their heart rate.

When seen in the water, beavers are often mistaken for muskrats. Try to get a look at the tail: Beavers have a broad, flat tail that doesn't show behind them when swimming, whereas muskrats have a thin tail that is either held out of the water or sways back and forth on the water's surface as the animal swims.

Beavers stand their ground and should not be closely approached when cornered on land. They face the aggressor, rear up on their hind legs, and hiss or growl loudly before lunging forward to deliver extremely damaging bites.

Wildlife Habitat Benefits

Beavers are well known for their construction efforts. They create dams and lodges for shelter and protection, largely with woody material. The woody material used in construction is either gathered from the ground locally, or from small and medium sized trees that the beavers fell with their teeth (Figures 4 and 5). The orange tooth enamel of their incisors is thicker on the front than the back, allowing for a self-sharpening wear pattern that maintains their chisel-like edge.



Figure 3. A beaver uses its tail as a prop in order to sit upright. (Miller and Yarrow 1994)

Depending on the type of water body and local habitat conditions, beavers may also construct burrows in the bank of a stream or river. These bank dens may be used in lieu of, or in conjunction with a lodge (Figure 5) and often take advantage of natural features such as logs or stumps.



Figure 4. Beavers have self-sharpening incisors. Photo courtesy Washington Dept. of Fish and Wildlife.

Beaver dams create habitat for many other animals and plants of California. Deer and elk

frequent beaver ponds to forage on shrubby plants that grow where beavers cut down trees for food or for use in constructing their dams and lodges. Weasels, raccoons, and herons hunt frogs and other prey along the marshy edges of beaver ponds. Sensitive species such as red-legged, yellow-legged and Cascade frogs all benefit from habitat created by beaver wetlands. Migratory water birds use beaver ponds as nesting areas and resting stops during migration. Ducks and geese often nest on top of beaver lodges since they offer warmth and protection, especially when lodges are formed in the middle of a pond. Willow flycatchers use the shrubby re-growth of chewed willow stumps to seek shelter and find food.

The trees that die as a result of rising water levels

attract insects, which in turn feed woodpeckers, whose holes later provide homes for other wildlife. In coastal rivers and streams, young coho salmon and steelhead may use beaver ponds to find food and protection from high flows and predators while waiting to grow big enough to go out to sea (Pollock et al. 2003).



Figure 5: Beaver pond and lodge on Sugar Creek, Siskiyou County. Photo by CDFW's Mary Olswang.

Preventing Conflicts

Beaver activities can cause problems, but before beginning a beaver control action, assess the problem and aim to match the most appropriate and cost-effective controls to the situation. There are two basic control methods used in California: prevention and lethal control. There are many non-profit organizations in California that support alternatives to lethal control. [The Benefits of Beaver to California & Stewardship Strategies Resource List](#) is a valuable educational resource.

Practical tips for minimizing conflict. It is almost impossible as well as cost prohibitive to exclude beavers from ponds, lakes, or impoundments.

Exclusion

Fencing off groups of trees or shrubs or garden plots with a low fence (three feet tall) will protect them. Since beavers generally do not like to stray far from water (this opens them up to greater risk of predation), fences may be effective even if they do not completely surround the area (if you choose to fence only part of an area, fence the portion of the area toward the water source, and part way along the sides). The fence should be constructed of woven or welded wire and be well anchored to the ground, so that beavers do not crush it, crawl under it, or walk over it.

An electrified wire strung 4-6" above the ground may also be an effective beaver deterrent. Fence chargers, wiring, and wire hangers suitable for use on pets and other small animals are generally available at hardware stores, feed stores, and home improvement centers.

Protection of individual trees and plants

Valuable trees and other plants adjacent to waterways may be protected from beavers by encircling them with hardware cloth (chicken wire is generally too flimsy), welded wire mesh or sheet metal (WDFW 2015). Welded wire mesh of 2" x 4" seems to be an optimal material in terms of

effectiveness, durability, aesthetics and cost of construction. The barrier should afford 6 inches to one foot of space between the barrier and the tree, extend at least three (preferably four) feet above ground level and be dug into the ground 3-4 inches for maximum effectiveness (Figure 6).

Alternatively, painting tree trunks with a sand and paint mixture may also prevent beaver gnawing, and may be more aesthetically pleasing than metal barriers. Beavers do not find the sand to be appetizing, and the mixture will be effective for approximately two years. The sand/paint ratio should be approximately 8 ounces (2/3 cup) of fine sand to one quart of latex paint.

Prevent flooding

Have you ever cut a notch into the dam and come back the next day to see it patched and re-enforced with mud? Beavers are attracted to the sound of running water and will repair most dam breaches and plug most culverts and pipes that are installed in order to drain the ponds. Beavers also require a certain depth of water to move around and escape predation.

A variety of devices and designs have been developed for controlling beaver impoundments and keeping blocked culverts open. The Flexible Leveler and Beaver Deceiver are two examples. Visit <http://www.beaversolutions.com/> for more information.

Modification of beaver dams, or any construction work within lakes or within the bed and bank of a stream, may require a Streambed Alteration Agreement permit from the California Department of Fish and Wildlife (CDFW). Before attempting to install any beaver devices, contact CDFW in order to determine for assistance.

Depredation Regulations

If all alternatives are exhausted and beavers are continuing to damage or threaten to damage land or property, the owner or tenant of such property may apply to the Department for a permit to kill the depredating animals. Upon satisfactory evidence of such damage or destruction, the Department shall issue a revocable permit allowing the taking of such animals (Fish and Game Code §4181). No animals killed pursuant to such a permit may be utilized by the permittee or his agent (Title 14, California Code of Regulations, §401(i)). For additional information, contact your regional Department of Fish and Wildlife office or visit <https://www.wildlife.ca.gov/Regions>.

Public Health Concerns

Beavers can be infected with the bacterial disease tularemia that is transmitted by ticks, flies and ingestion of contaminated water (Gaydos 1998). Human can also contract the disease by eating infected meat or allow an open wound come in contact with an infected animal.

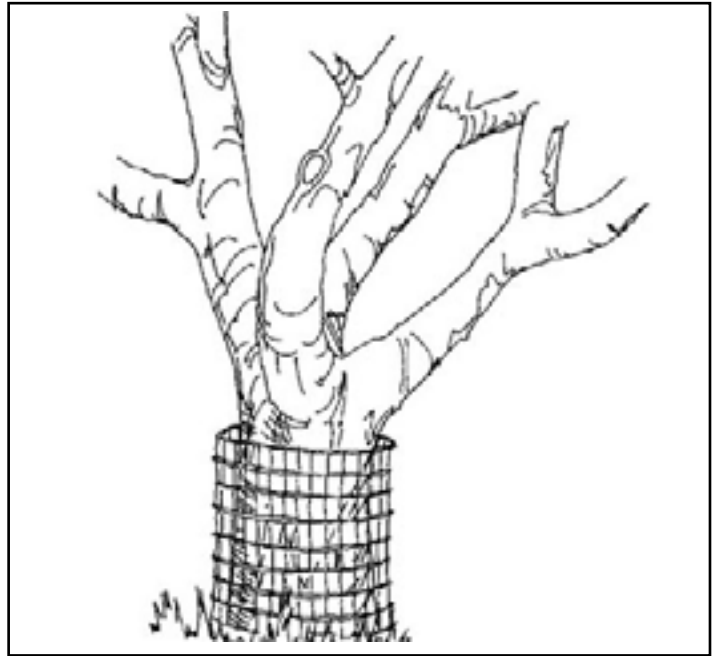


Figure 6. Drawing by Jenifer Reese (Miller and Yarrow 1994)

Beavers defecate in the water in which they live. Ingested water by humans may cause Giardia, a common flu-like infection.

Acknowledgments

Occidental Arts and Ecology Center WATER Institute (OAEC)
Washington Department of Fish & Wildlife (WDFW)

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Gaydos, J. 1998. Giardia and Wildlife. Southeastern Cooperative Wildlife Disease Study Briefs. College of Veterinary Medicine, University of Georgia, Athens, GA. Available online: http://www.uga.edu/scwds/topic_index/1998/GiardiaandWildlife.pdf

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Pollock, M.M., M.Heim, and D. Werner. 2003. Hydraulic and geomorphic effects of beaver dams and their influence on fishes. *American Fisheries Society Symposium* 37:213-233.

Washington Department of Fish and Wildlife (WDFW). 2015. Living with Wildlife. <http://wdfw.wa.gov/living/beavers.html#trapping>



Tracking Number: (2019-026)

To request a change to regulations under the authority of the California Fish and Game Commission (Commission), you are required to submit this completed form to: California Fish and Game Commission, 1416 Ninth Street, Suite 1320, Sacramento, CA 95814 or via email to FGC@fgc.ca.gov. Note: This form is not intended for listing petitions for threatened or endangered species (see Section 670.1 of Title 14).

Incomplete forms will not be accepted. A petition is incomplete if it is not submitted on this form or fails to contain necessary information in each of the required categories listed on this form (Section I). A petition will be rejected if it does not pertain to issues under the Commission's authority. A petition may be denied if any petition requesting a functionally equivalent regulation change was considered within the previous 12 months and no information or data is being submitted beyond what was previously submitted. If you need help with this form, please contact Commission staff at (916) 653-4899 or FGC@fgc.ca.gov.

SECTION I: Required Information.

Please be succinct. Responses for Section I should not exceed five pages

1. Person or organization requesting the change (Required)

Name of primary contact person: Stanley Backlund, Trout Unlimited El Dorado

Address: [REDACTED]

Telephone number: [REDACTED]

Email address: [REDACTED]

2. Rulemaking Authority (Required) - Reference to the statutory or constitutional authority of the Commission to take the action requested: In 1945 the Fish and Game Commission received the responsibility for promulgating regulations to manage sport fishing and hunting. This act was done by the Legislature, through a constitutional amendment. The Fish and Game Commission has a wide range of responsibilities that continually expands and includes: Seasons, bag limits and methods of take for game animals, sport fishing and some commercial fishing. Beginning October 1, 2015, every person or agency recommending that a regulation be added, amended, or repealed must submit a petition to the commission using the authorized petition form: [FGC 1](#).

3. Overview (Required) - Summarize the proposed changes to regulations: Revise the bag limit for fishing on Caples Creek in El Dorado County. The winter regulations shall be applied year round. The effect is to reduce the summer take from five fish to zero.

4. Rationale (Required) - Describe the problem and the reason for the proposed change: Caples Creek was designated as a Wild Trout Water by the DFW in 2015. No management changes have been made in the interim. Wild Trout Waters are those that support self-sustaining (wild) populations of trout, are aesthetically pleasing and environmentally productive, provide adequate catch rates in terms of numbers of trout, and are open to public angling. Fish populations in Caples Creek do not support this definition. Surveys do not find rainbow trout where observed prior to designation. Restricting take should result in a rebound of fish population. Our El Dorado Chapter of Trout Unlimited has a goal to create an improved fishery with a large population of Rainbow Trout including fish in excess of 12 inches in length. This change will allow fish repopulation, improve fishing opportunity and result in an increase in visitation to the region. The existing five fish limit allows removal of the prior population.



Surveys conducted in 1998, 1999, 2000 and 2001 prior to licensing found rainbow trout at all survey sites. In 2011 the DFW found densities of 849 rainbow trout per mile averaged from all sites. Their angling survey yielded 1-2 fish per hour. In 2011, 41 brook trout and 4 brown trout were reported. Limited surveys of the creek have been performed four times from 2011 to 2017. No Rainbow Trout were detected. Fishing by members of our Trout Unlimited chapter in 2013 and 2014 was unproductive. There are 58 Wild Trout Waters in California. Forty of them have special regulations limiting catch. Caples is deserving of a limit to protect fish stock.

SECTION II: Optional Information

5. Date of Petition: March 22, 2019

6. Category of Proposed Change

- ☒ Sport Fishing
- ☐ Commercial Fishing
- ☐ Hunting
- ☐ Other, please specify:

7. The proposal is to: *(To determine section number(s), see current year regulation booklet or <https://govt.westlaw.com/calregs>)*

- ☒ Amend Title 14 Section(s): Division 1-Department of Fish and Wildlife Freshwater Sport Fishing Regulations, 7.5 Waters with Special Fishing Regulations, (b) Special Regulations, (4.5)
- ☒ Add New Title 14 Section(s): 7.5 Waters with Special Fishing Regulations, (b) Special regulations. (New paragraph) Caples Creek: Open all year. Only artificial lures with barbless hooks may be used. 0 trout.
- ☐ Repeal Title 14 Section(s): None

8. If the proposal is related to a previously submitted petition that was rejected, specify the tracking number of the previously submitted petition [Click here to enter text.](#)
Or ☒ Not applicable.

9. Effective date: If applicable, identify the desired effective date of the regulation.
If the proposed change requires immediate implementation, explain the nature of the emergency: April 26, 2020.

10. Supporting documentation: Identify and attach to the petition any information supporting the proposal including data, reports and other documents: Attachment 1 provides links to the survey data referenced in paragraph 4.

11. Economic or Fiscal Impacts: Identify any known impacts of the proposed regulation change on revenues to the California Department of Fish and Wildlife, individuals, businesses, jobs, other state agencies, local agencies, schools, or housing: This regulatory change is expected to expand catch and release opportunities in Caples Creek thereby increasing visitation and recreational spending in the three counties of El Dorado, Amador and Alpine.



12. Forms: If applicable, list any forms to be created, amended or repealed:

None

SECTION 3: FGC Staff Only

Date received: [Received by email on Friday, November 22, 2019 at 11:00 AM.](#)

FGC staff action:

- ☐ Accept - complete
- ☐ Reject - incomplete
- ☐ Reject - outside scope of FGC authority

Tracking Number 2019-026

Date petitioner was notified of receipt of petition and pending action: _____

Meeting date for FGC consideration: _____

FGC action:

- ☐ Denied by FGC
- ☐ Denied - same as petition _____
- ☐ Granted for consideration of regulation change

Tracking Number

Attachment 1 to Fish and Game Commission Petition re Caples Creek

Links to Caples Creek Trout Monitoring Reports

1. FISHERIES DATA REPORT FOR PROJECT-AFFECTED STREAM REACHES, EL DORADO IRRIGATION DISTRICT Hydroelectric Project 184. April 7, 2002. Surveys 1998, 1999, 2000, 2001.
<https://www.eid.org/home/showdocument?id=4719>
2. FERC Project No. 184. Rainbow Trout Monitoring 2011
<https://www.eid.org/home/showdocument?id=4717>
3. FERC Project No. 184 Rainbow Trout Monitoring 2012
<https://www.eid.org/home/showdocument?id=3394>
4. FERC Project No. 184 Rainbow Trout Monitoring 2016
<https://www.eid.org/home/showdocument?id=7102>
5. FERC Project No. 184 Rainbow Trout Monitoring 2017
<https://www.eid.org/home/showdocument?id=9785>
6. Caples Creek 2009 Summary Report September 8-10, 2009. Department of Fish and Game
<https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=29677&inline>
7. Caples Creek 2011 Summary Report October 18-21, 2011. Department of Fish and Game
<https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=118303&inline>

From: [REDACTED]

Sent: Thursday, January 30, 2020 8:13 PM

To: FGC <FGC@fgc.ca.gov>

Subject: Re: Fish and Game Commission meeting agenda - February 21, 2020

This may not be the right place, but I want to make a comment since I am unable to attend the upcoming meeting. I am appalled to see:

Petition #2019-023 AM 1: Authorize hunting of ravens
III. Petition #2019-024 AM 1: Authorize hunting of blackbirds, cowbirds, grackles, crows, and magpies

With the loss of billions of birds over the past 2 decades, it is foolish and arrogant to kill MORE birds just because they are not native/or unwanted. We need every bird we have! With habitat loss and climate change, species will fill emptied niches; we CANNOT allow those niches to be left vacant so we can wait for birds we "prefer" to come back.

Songbirds mostly disappeared from my home in Sonoma County many years ago; after the Tubbs fire, hundreds of refugee birds showed up! I go through 40 pounds of feed a month for them. Let Nature find the correct balance.

Thank you.

Blessings, Jane

~^..^~ Denali's Legacy Arctic Dog Rescue ~^..^~

Each day, a person who eats a vegan diet saves 1,100 gallons of water, 45 pounds of grain, 30 square feet of forested land, 20 pounds of CO2 equivalent, and ONE ANIMAL'S LIFE.

Food is GROWN - NOT BORN. Food has DIRT - NOT BLOOD. Food does NOT have a family and a heartbeat.

From: Kara Norris [REDACTED]

Sent: Sunday, February 2, 2020 10:46 PM

To: FGC

Subject: Comment in support of Petition #2019-024

Hello,

I am writing in support of Petition #2019-024: Authorize hunting of blackbirds, cowbirds, grackles, crows, and magpies.

There are many reasons, such as:

- They are plentiful, often becoming a nuisance or a human health and safety issue.
- There is a standing federal depredation order on them.

<https://law.cornell.edu/cfr/text/50/21.43>

-California considers cowbirds as an invasive species.

<https://wildlife.ca.gov/Conservation/Invasives/Species/Cowbird>

The above birds open up a new quarry base that will bring more hunters into the field, in addition to providing sustainable game meat.

I urge the commission to support Petition 2019-24.

Thank you for your time,

Kara Norris

From: NATHANIEL NORRIS

Sent: Sunday, February 2, 2020 10:44 PM

To: FGC

Subject: Comment in support of Petition #2019-23

Petition #2019-023 AM 1: Authorize hunting of ravens

I am writing in support of the hunting of the common Raven (corvus corax) for the following reasons.

1. The Raven population is out of control in California due to human interaction.

<https://www.audubon.org/news/the-common-raven-boom-rugged-west-isnt-necessarily-good-thing>

2. Ravens have decimated the sensitive native fauna and Flora here in California.

<https://www.nps.gov/articles/ravens.htm>

3. Ravens will open up new hunting opportunities. Bringing more hunters to the field.

4. Ravens can be a viable source of game meat.

I urged the commission to support petition number #2019-23

Thank you for your consideration,

Nathan Norris

Sent from my T-Mobile 4G LTE Device

Get [Outlook for Android](#)

CALIFORNIA FISH AND GAME COMMISSION PETITIONS FOR REGULATION CHANGE - ACTION

Revised 2/14/2020

FGC - California Fish and Game Commission DFW - California Department of Fish and Wildlife WRC - Wildlife Resources Committee MRC - Marine Resources Committee

Grant: FGC is willing to consider the petitioned action through a process Deny: FGC is not willing to consider the petitioned action Refer: FGC needs more information before deciding whether to grant or deny

Tracking No.	Date Received	Name of Petitioner	Subject of Request	Short Description	FGC Receipt Scheduled	FGC Action Scheduled	Staff Recommendation	Marine or Wildlife?
2019-012 (b)	5/30/2019	Carl W. Vogler	Water pumps and clams	Prohibit the use of hand operated water pumps to take gaper and other clams.	6/12-13/2019	4/17/2019: Referred to DFW ----- 2/21/2020	DFW recommendation on 2/21/2020: GRANT for consideration in a future rulemaking.	Marine
2019-014 (b)	6/20/2019	Karen Martin, PhD	Recreational take of California grunion	Amend California grunion (<i>Leuresthes tenuis</i>) recreational take regulations to (1) change the bag limit from "none" to "ten", (2) reduce the season length, and (3) shift the timing of the seasonal closure north of Pt. Conception.	8/7-8/2019	10/9-10/2019: Referred to DFW ----- 2/21/2020	DFW recommendation on 2/21/2020: GRANT in concept for a future rulemaking, with details for proposal to be developed by DFW following its completion of an enhanced status report for the species. (See DFW memo in Exhibit B.3 of Item 20.)	Marine



Tracking Number: (2019-012)

To request a change to regulations under the authority of the California Fish and Game Commission (Commission), you are required to submit this completed form to: California Fish and Game Commission, 1416 Ninth Street, Suite 1320, Sacramento, CA 95814 or via email to FGC@fgc.ca.gov. Note: This form is not intended for listing petitions for threatened or endangered species (see Section 670.1 of Title 14).

Incomplete forms will not be accepted. A petition is incomplete if it is not submitted on this form or fails to contain necessary information in each of the required categories listed on this form (Section I). A petition will be rejected if it does not pertain to issues under the Commission's authority. A petition may be denied if any petition requesting a functionally equivalent regulation change was considered within the previous 12 months and no information or data is being submitted beyond what was previously submitted. If you need help with this form, please contact Commission staff at (916) 653-4899 or FGC@fgc.ca.gov.

SECTION I: Required Information.

Please be succinct. Responses for Section I should not exceed five pages

1. Person or organization requesting the change (Required)

Name of primary contact person: Carl W. Vogler

Address:

Telephone number:

Email address:

2. Rulemaking Authority (Required) - Reference to the statutory or constitutional authority of the Commission to take the action requested: FGC §200, 202, 205, 210, 219, and 220

3. Overview (Required) - Summarize the proposed changes to regulations: I propose to prohibit the use of hand operated water pumps to take gaper and other clams.

4. Rationale (Required) - Describe the problem and the reason for the proposed change: In the past a person wanting to get a limit of gaper clams needed a daylight tide lower than 0.5' MLLW in order to dig a hole in the mud no longer covered with water. In any given year no more than 45% of the days would have such an opportunity. Hand operated water pumps have become popular with which to jet out the gaper clams. The pumps not only allow users to access clams on higher tides but actually require that some water be present in order to function. Skilled users are able to get their limits of gaper clams on most days. At Lawson's Landing in Dillon Beach on Tomales Bay, we are seeing an average of 40 people per day getting their 10 clam limits, or about 60,000 clams taken by the end of May this year. One of the clammers told me that he thought that there were about two more years of clams left before he'd have to go somewhere else.

SECTION II: Optional Information

5. Date of Petition: May 29, 2019

6. Category of Proposed Change



- ☒ Sport Fishing
- ☐ Commercial Fishing
- ☐ Hunting
- ☐ Other, please specify:

7. **The proposal is to:** (*To determine section number(s), see current year regulation booklet or <https://govt.westlaw.com/calregs>*)
- ☒ Amend Title 14 Section(s):29.20
 - ☐ Add New Title 14 Section(s):
 - ☐ Repeal Title 14 Section(s):
8. **If the proposal is related to a previously submitted petition that was rejected, specify the tracking number of the previously submitted petition**
Or ☒ Not applicable.
9. **Effective date:** If applicable, identify the desired effective date of the regulation.
If the proposed change requires immediate implementation, explain the nature of the emergency: February 1, 2020
10. **Supporting documentation:** Identify and attach to the petition any information supporting the proposal including data, reports and other documents: Letter from Carl Vogler of May 13, 2019
11. **Economic or Fiscal Impacts:** Identify any known impacts of the proposed regulation change on revenues to the California Department of Fish and Wildlife, individuals, businesses, jobs, other state agencies, local agencies, schools, or housing:
12. **Forms:** If applicable, list any forms to be created, amended or repealed:

SECTION 3: FGC Staff Only

Date received: [Received by email on Thursday, May 30, 2019 at 8:00 AM.](#)

FGC staff action:

- ☒ Accept - complete
- ☐ Reject - incomplete
- ☐ Reject - outside scope of FGC authority

Tracking Number 2019-012

Date petitioner was notified of receipt of petition and pending action: June 12-13, 2019

Meeting date for FGC consideration: August 7-8, 2019

FGC action:

- ☐ Denied by FGC
- ☐ Denied - same as petition _____
Tracking Number
- ☐ Granted for consideration of regulation change

Received by email on Thursday, May 30, 2019 at 8:00 AM as an attachment to petition 2019-012.

California Fish and Game Commission

May 7, 2019

Marine Resources Committee

P.O. Box 944209

Sacramento, CA 94244-2090

To Whom It May Concern,

I am one of the owners of Lawson's Landing in Dillon Beach. Lawson's Landing is located at the mouth of Tomales Bay and has been providing access to the California coast since the late 1950's. Fishing, crabbing and clamming have been the major attractions with the plentiful gaper clams on Clam and Seal islands being the original and most consistent draw. On a tide low enough for the islands to be exposed, with a little hard work and a short boat ride, most people can dig enough clams for a tasty dinner. Unfortunately, that looks like it's about to change.

In the last few years a new innovation, the hand operated water pump, has allowed clammers to retrieve their limits of gapers even when the tide isn't low enough for the islands to come out of the water. In fact, the pumps only work while in 6" of water or more. Where clams were only attainable 38% to 45% of the days per year, now attainable days approach 80% of the year. The pumps also limit physical damage to the individual clams, making for a more attractive, and therefore more marketable, product that many are tempted to sell. Gaper clams, as unlikely as it sounds, are becoming the new abalone.

Lawson's Landing operated boats to ferry clammers over to the islands for over forty years, but when we saw the increased number of people clamming and the decreasing catches of clams, we ended a very lucrative part of our business in order to preserve the resource. The clams bounced back in the 2000's, but now a new generation of clammers with cheap inflatable boats and hand pumps paddle across almost every day to collect their ten clams each. I'm writing this now because one of the clammers told me today that he thought that there's about two years of clams left on the islands. When they're gone from here he'll go somewhere else, he said.

I would like to see a change in the regulations that would outlaw hand operated water pumps in the same way that hooked devices are illegal to use. The gapers will have a chance to recover again if the number of opportunities to dig them up remain limited.

Carl W. Vogler

Lawson's Landing Inc.

137 Marine View Dr.

Dillon Beach, CA 94929-0067



Tracking Number: (2019-014)

To request a change to regulations under the authority of the California Fish and Game Commission (Commission), you are required to submit this completed form to: California Fish and Game Commission, 1416 Ninth Street, Suite 1320, Sacramento, CA 95814 or via email to FGC@fgc.ca.gov. Note: This form is not intended for listing petitions for threatened or endangered species (see Section 670.1 of Title 14).

Incomplete forms will not be accepted. A petition is incomplete if it is not submitted on this form or fails to contain necessary information in each of the required categories listed on this form (Section I). A petition will be rejected if it does not pertain to issues under the Commission's authority. A petition may be denied if any petition requesting a functionally equivalent regulation change was considered within the previous 12 months and no information or data is being submitted beyond what was previously submitted. If you need help with this form, please contact Commission staff at (916) 653-4899 or FGC@fgc.ca.gov.

SECTION I: Required Information.

Please be succinct. Responses for Section I should not exceed five pages

1. Person or organization requesting the change (Required)

Name of primary contact person: Karen Martin, PhD

Address: [REDACTED]

Telephone number: [REDACTED]

Email address: karen.martin@pepperdine.edu

2. **Rulemaking Authority (Required)** - Reference to the statutory or constitutional authority of the Commission to take the action requested: **Fish and Game Code Section 8381**; Section 28.00 cites sections 200, 202 205, 210, 219, and 220 of the Fish and Game Code. Section 200 is relevant as this is not a commercial take. Section 202 was repealed Stats 2016. Section 205 is relevant as it allows the Commission to change or abolish an open season and to establish or change a bag limit. Section 210 is repealed Stats 2016. Section 219 is relevant as it provides the Commission authority to act to protect fish, wildlife, and natural resources. Section 220 is repealed Stats 2016.

3. **Overview (Required)** - Summarize the proposed changes to regulations: 1) Change the bag limit from "none" to "ten of one species" for California Grunion *Leuresthes tenuis*; 2) Reduce the length of the seasonal closure for California Grunion; 3) Shift the timing of the seasonal closure north of Pt. Conception for California Grunion.

4. **Rationale (Required)** - Describe the problem and the reason for the proposed change: See Attached for full text: Rationale for request for change in regulations: Unique Species Targeted During Critical Reproductive Season in a Shrinking Habitat

SECTION II: Optional Information

5. **Date of Petition: June 2019**



6. Category of Proposed Change

- ☒ Sport Fishing
- ☐ Commercial Fishing
- ☐ Hunting
- ☐ Other, please specify:

7. The proposal is to: *(To determine section number(s), see current year regulation booklet or <https://govt.westlaw.com/calregs>)*

- ☐ Amend Title 14 Section(s): 27.60(b); no bag limit, to 27.60 (a), limit of 10 for one species; Section 28.00, seasonal closure, may be taken June 1 – March 31; change to July 1 – March 31 south of Pt. Conception. North of Pt. Conception, seasonal closure, change so may be taken September 1 – March 31. Section 28.00 cites sections 200, 202 205, 210, 219, and 220 of the Fish and Game Code. Section 200 is relevant as this is not a commercial take. Section 202 was repealed Stats 2016. Section 205 is relevant as it allows the Commission to change or abolish an open season and to establish or change a bag limit. Section 210 is repealed Stats 2016. Section 219 is relevant as it provides the Commission authority to act to protect fish, wildlife, and natural resources. Section 220 is repealed Stats 2016.
- ☐ Add New Title 14 Section(s):
- ☐ Repeal Title 14 Section(s):

8. If the proposal is related to a previously submitted petition that was rejected, specify the tracking number of the previously submitted petition

Or ☒ Not applicable.

9. Effective date: If applicable, identify the desired effective date of the regulation. If the proposed change requires immediate implementation, explain the nature of the emergency: April 2020

10. Supporting documentation: Identify and attach to the petition any information supporting the proposal including data, reports and other documents: Powerpoint about California grunion, scientific journal article on population trends of California grunion .

11. Economic or Fiscal Impacts: Identify any known impacts of the proposed regulation change on revenues to the California Department of Fish and Wildlife, individuals, businesses, jobs, other state agencies, local agencies, schools, or housing: There is no commercial fishery and it is illegal to sell recreational catch. No gear is legal for this species. It is unlikely that there will be negative economic impacts from reduced recreational fishing. It is possible that improved grunion runs will attract tourism for wildlife watching during the expanded closed season. Tourism agencies in coastal cities currently list grunion runs as an attraction.

12. Forms: If applicable, list any forms to be created, amended or repealed:

SECTION 3: FGC Staff Only

Date received: [Received by email on Thursday, June 20, 2019 at 7:22 AM.](#)



FGC staff action:

- ☒ Accept - complete
- ☐ Reject - incomplete
- ☐ Reject - outside scope of FGC authority

Tracking Number 2019-014

Date petitioner was notified of receipt of petition and pending action: August 7-8, 2019

Meeting date for FGC consideration: October 9-10, 2019

FGC action:

- ☐ Denied by FGC
- ☐ Denied - same as petition _____
- ☐ Granted for consideration of regulation change

Tracking Number

Rationale for request for change in regulations: Unique Species Targeted During Critical Reproductive Season in a Shrinking Habitat

Life History and Current Regulations:

California grunion *Leuresthes tenuis* (Atherinopsidae), indigenous endemic marine fish, emerge out of water onto sandy beaches on the Pacific coast of California and Baja California to reproduce (Gregory, 2001). In a unique recreational fishery, people capture these fish out of water with bare hands during their midnight spawning runs (Spratt, 1986; Sandrozkinski, 2013).

Because of their unusual life cycle, California Grunion are particularly vulnerable to overharvest. Less than 10 years after the first published scientific description of their spawning behavior (Barnhart, 1918; Thompson, 1919), the first regulations to protect them were enacted in 1927 (Clark, 1926, 1938) by the California Department of Fish and Game (now Wildlife), CDFW. At that time, people would line the shore, capturing hundreds of grunion with improvised nets made of bed sheets (Andrew Olson, Jr., personal communication), using them for food and fertilizer.

Early protections included a seasonal closure, with no take from April through June, the peak of the spawning season. Gear restrictions specify no gear at all; only bare hands are allowed for capturing these fish, presumably to give them a sporting chance while on shore. Under the age of 16, children do not need a fishing license to catch grunion during open season. No commercial use of the species is permitted. However, there is no bag limit, and no requirement to report recreational catch of this species.

Walker (1949) observed grunion runs on Scripps Beach directly following World War II. Based on his recommendations, CDFW shortened the seasonal closure to April and May. Gear restrictions and license requirements remained in place. At that time California's population was substantially smaller, 10 million. Today, more than 35 million people live along one of the most densely populated coasts in the world, and millions more visit as tourists.

Sandy beaches are critical to California grunion as Essential Fish Habitat for spawning (Robbins 2006). However, beaches in California and worldwide are losing habitat by coastal squeeze (Defeo et al., 2009; Shoeman et al., 2014; Martin, 2015), with sea level rise and erosion encroaching on the beach from the seaward side, and coastal development and seawalls preventing natural retreat of the beach on the landward side (Dugan et al., 2008). Exacerbated by climate change and increasing human population, California is predicted to lose 31 to 67% of its sandy beaches by the year 2100 under current predictions of sea level rise (Vitousek et al., 2017).

Current uses of California Grunion:

Some anglers catch this species for bait, some people catch these small fish to consume whole, but most of those capturing the grunion report they are doing so for the sport, not for any specific use but because hunting them is part of popular culture.

California Grunion runs are highlighted in public education programs of public aquariums and California State Beaches, and for youth organizations such as the Boy Scouts. Because runs follow the highest spring tides of full or new moons, likely nights and times can be forecast (Walker, 1952; Spratt, 1986). Runs can be dazzling, with thousands of fish moving out of waves onto shore for an hour or more.

Because of its beach-spawning habits, California Grunion has been identified as a Key Indicator Species for the South and Central regions of California Marine Protected Area (Marine Protected

Area Monitoring Action Plan, 2018), and as an indicator species for climate change on beaches in the Ventura County Coastal Resilience Plan (<https://www.vcrma.org/vc-resilient-coastal-adaptation-project>).

Population status of California Grunion:

Traditional fishery methods cannot be used for stock assessments of California grunion. This species has never been abundant (Gregory, 2001). It is planktivorous (Higgins and Horn, 2014) and does not take a hook. Adults are rarely caught in trawl surveys except within enclosed bays (Allen et al., 2002; Martin et al., 2013; Williams et al., 2016). The only time California grunion can reliably be observed is during their spawning runs.

Runs may occur when tides are suitable, within a two-hour window following the highest nightly tide in four nights after full and new moons in spring and summer. However, often on nights when runs are forecast, no grunion are seen on shore (Martin et al., 2019).

Volunteer citizen scientists, the Grunion Greeters, report observations of spawning runs on beaches all along the California Coast. With reports across the habitat range over two decades (Martin et al., 2007, 2011), this long-term dataset can discern broad trends in population, in order to guide conservation of this endemic species. Grunion Greeters assess the number of fish on shore, the length of shoreline involved, and the duration of the spawning run at its peak with a metric, the Walker Scale, which ranges from W0 (no fish) to W5 (fish covering the shore).

Over 4500 Grunion Greeters have provided over 5000 reports in the past two decades. This compilation is the most complete dataset for this species in existence, both in terms of geographic coverage and duration of observations. Reports come from the entire habitat range, over 50 beaches in California and Baja California, Mexico. A range extension for spawning runs was discovered in 2002 in San Francisco Bay (Johnson et al., 2009), followed by a northward range extension to Tomales Bay in 2005 (Roberts et al., 2007).

Concerns raised by reports from Grunion Greeters:

Large spawning runs still occur, but smaller grunion runs are much more common than in past. Spawning on shore has declined significantly across much of the habitat range in the past fifteen years. This pattern is consistent for this endemic fish across the three coastal counties constituting its core habitat (San Diego, Orange, and Los Angeles), and also on individual beaches known historically for large grunion runs (Martin et al., 2019).

California grunion appear to be shifting habitat range northward to some extent (Martin et al. 2013; Martin et al., 2019). The shift in habitat comes at the cost of smaller adult size and reduced number of eggs, as well as a shorter spawning season (Johnson et al., 2009).

Noisy activities of recreational grunion hunters on shore disrupt spawning runs, preventing fish from reproducing before capture. Poaching during closed season is common on some urban beaches, reported in about 20% of closed season observations. Collection of spawning fish is nearly universal during open season, identified in 90% of open season reports, disrupting runs and preventing reproduction while removing ripe adults from the population (Martin et al., 2019). Regulations are rarely and unevenly enforced, in part because spawning runs always occur in the dark of night.

Many grunion hunters do not fish for any other species, and do not possess fishing licenses. Thus the potential number of people hunting California Grunion is far greater than the 2.5 million sport fishing licenses that were sold in California in 2016.

The occasional presence of large spawning aggregations may create the illusion of abundance even when a population is depleted (Erisman et al., 2011). Occasional large runs may tempt resource managers to believe that these kinds of runs are both more common and more widespread geographically than is the actual situation (Sadovy and Domeier, 2005).

We suggest it is possible that the numbers of adult fish could drop too low for successful spawning even when some members of the species are present and ripe. Runs with fewer than a hundred individuals usually do not include spawning events or egg deposition. Small numbers of fish in a run indicate unsuccessful reproduction. The consistent pattern of decline in median run size is of great concern for this beach-spawning species.

The sister species, the Gulf Grunion *Leuresthes sardina*, endemic to the northern Gulf of California (Bernardi et al., 2003), shares the beach-spawning habits of *L. tenuis* (Thomson and Muench, 1976). The Gulf Grunion appears on the IUCN Red List as “Near Threatened” because of potential habitat loss and human interference. (Findlay et al., 2010). Our California Grunion may face even greater threats than the Gulf Grunion because of larger human populations and more coastal development in California compared with Mexico.

Recommendations for change:

Although this managed species enjoys some unique protections, fishing regulations have not changed since 1949, while fishing pressure has increased.

We strongly encourage increased protection for this charismatic indigenous endemic marine fish.

- Section 28.00, seasonal closure, may be taken June 1 – March 31 → change seasonal closure to include June; may be taken July 1 – March 31 south of Pt. Conception. North of Pt. Conception, seasonal closure, may be taken September 1 – March 31.

Change requested: For the southern population, return seasonal closure April - June, as originally designated in 1927. For the *L. tenuis* north of Pt. Conception, shift the timing of the seasonal closure, to protect the peak season that occurs later there, closure from April – August.

- Section 27.60(b); no bag limit → change to 27.60 (a), limit of 10 for one species.

Change requested: We recommend a change from no bag limit to a limit of no more than 10 fish.

Section 28.00 cites sections 200, 202 205, 210, 219, and 220 of the Fish and Game Code. Section 200 is relevant as this is not a commercial take. Section 202 was repealed Stats 2016. Section 205 is relevant as it allows the Commission to change or abolish an open season and to establish or change a bag limit. Section 210 is repealed Stats 2016. Section 219 is relevant as it provides the Commission authority to act to protect fish, wildlife, and natural resources. Section 220 is repealed Stats 2016.

References Cited

Allen L. G., Findlay A. M., Phalen C. M. 2002. Structure and standing stock of the fish assemblages of San Diego Bay, California from 1994 to 1999. *Bulletin Southern California Academy of Sciences*, 101: 49-85.

- Barnhart P. S., 1918. The spawning of the little-smelt *Leuresthes tenuis* (Ayres). *California Fish & Game*, 4: 181-182.
- Bernardi G., Findley L., Rocha-Olivares A. 2003. Vicariance and dispersal across Baja California in disjunct marine fish populations. *Evolution*, 57: 1599–1609.
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Tracking Populations of California Grunion: Petition for Change

Dr. K. L. M. Martin,
Pepperdine University,

With citizen science data
from the
Grunion Greeters

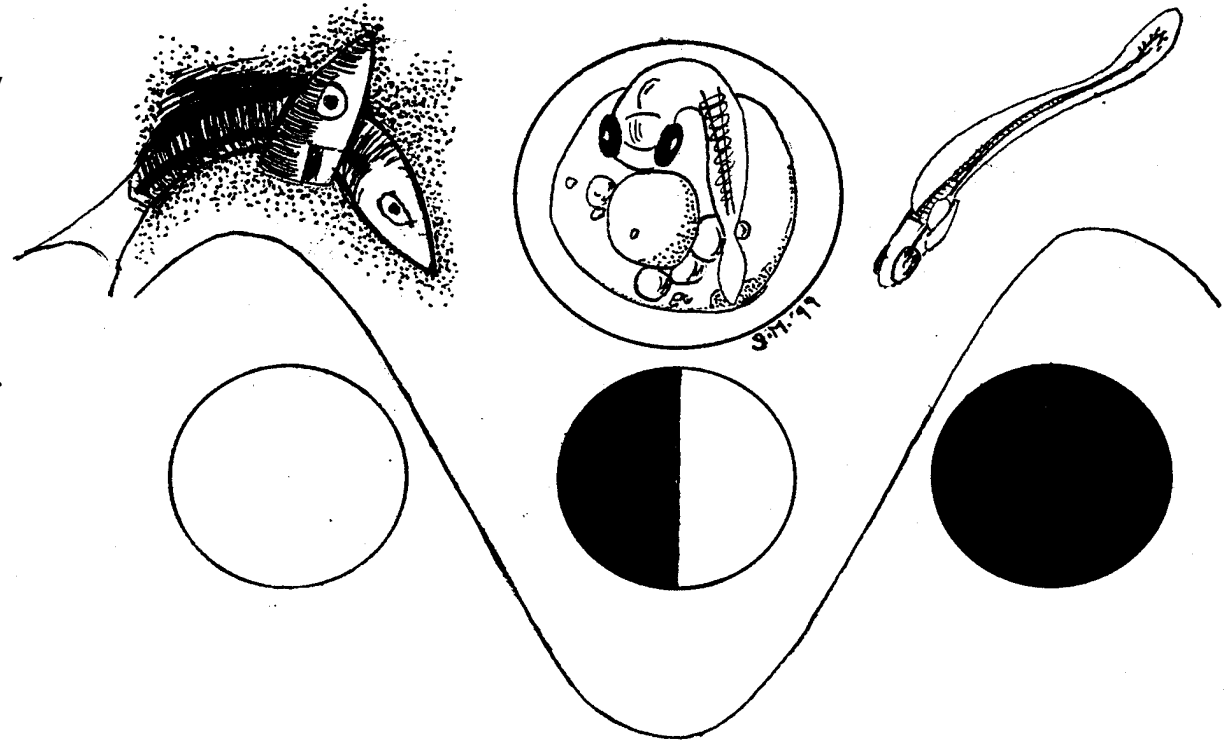


Photo: Carl Manaster, Grunion.org

CA Grunion life cycle

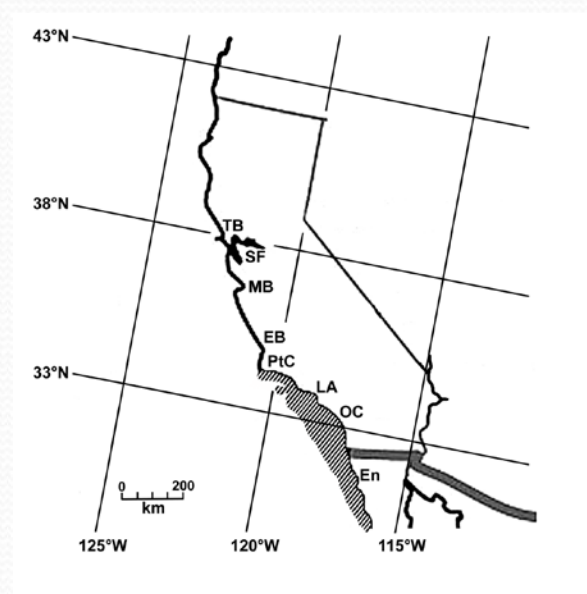
Leuresthes tenuis

- Endemic species, only in California and Baja California, Mexico.
- Spawn on sandy beaches during high tides, after full or new moons.
- Eggs incubate out of water under sand until the next semilunar tides.
- Larvae hatch with rising tides.



Art by G. Martin

CA Grunion: CDFW Managed Species



This indigenous endemic marine fish occurs mainly off the coast of three counties: San Diego, Orange, and Los Angeles.

Recently the habitat expanded to a few locations north of Pt. Conception.

CA Grunion have never been abundant.

CA Grunion are vulnerable to recreational overharvest and to other human activities on the shore.

Since 1927, spawning CA Grunion are protected by:



Photo by J. Flannery, M. Reiss, Grunion.org



- Closed season (no take) April and May, originally April - June.
- Gear restrictions (none allowed).
- License requirement for age 16 and above.
- HOWEVER--
- No bag limit.
- No reporting of catch.

The challenges of assessing the stock of *L. tenuis* are many.

- Traditional fishery sampling methods don't work.
- CA Grunion are observed only during spawning runs.
 - Runs vary widely over space and time.
 - All runs occur around the same time of night.
 - Runs occur late at night on dark beaches.

Solution: Grunion Greeters!

Citizen scientists attend training workshops and monitor specific beaches during nights when grunion runs are forecast.

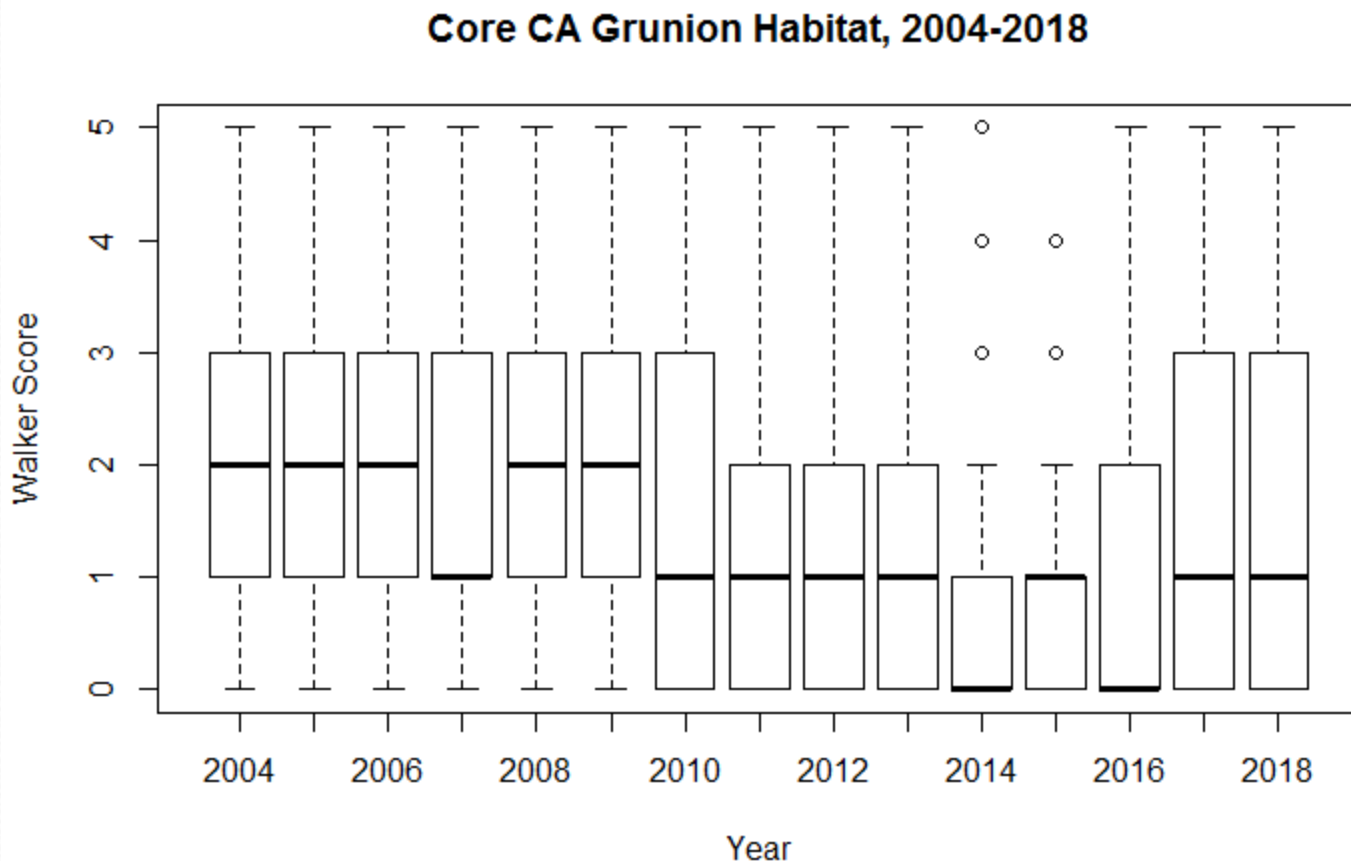


Walker Scale for Grunion Runs

used by Grunion Greeters

- **W-0**: No fish show up, or just a few, no spawning.
- **W-1**: More than 10, and up to 100 fish show up, little or no spawning behavior
- **W-2**: 100-500 fish; scattered across the beach or in one area, spawning activity
- **W-3**: several hundred to 1000 fish spawning in one or several locations along the beach
- **W-4**: thousands of fish spawning across a wide area of the beach
- **W-5**: fish covering the beach across a wide area, run lasts an hour or more

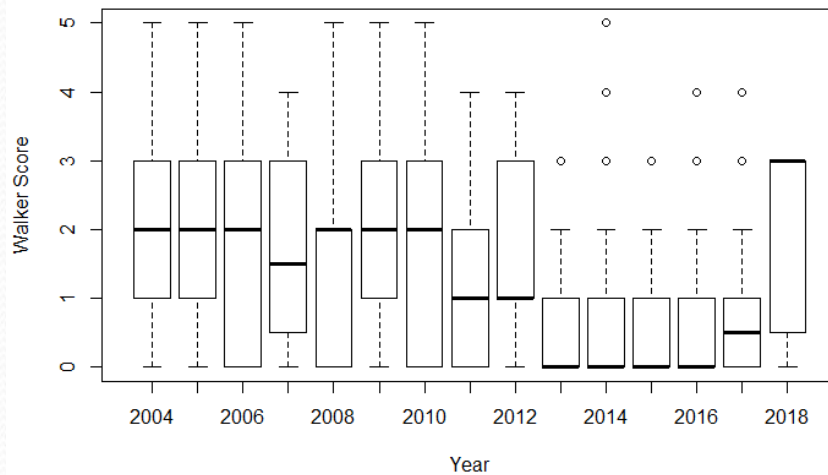
Reports indicate runs have decreased over time in the core species habitat.



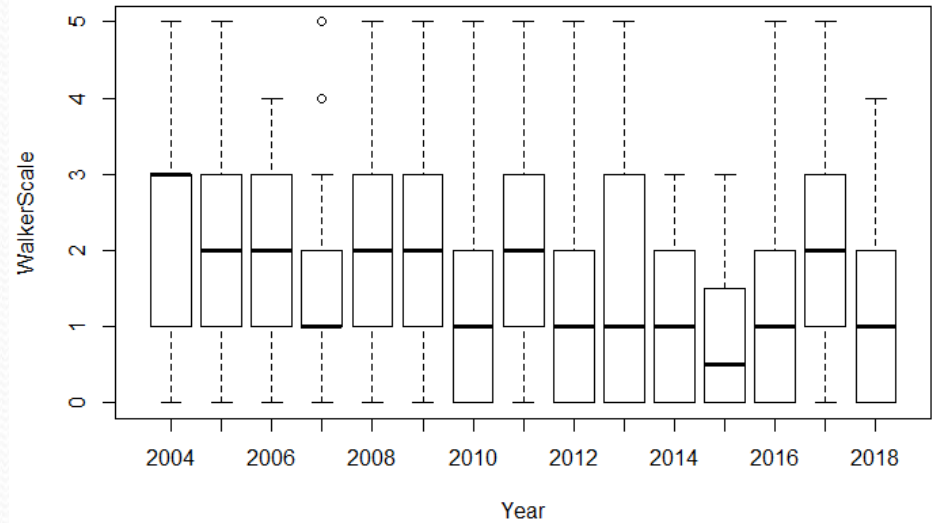
Median run has declined over the past 15 years in San Diego, Orange, and LA counties.

Decline in runs is consistent across each county in the core habitat.

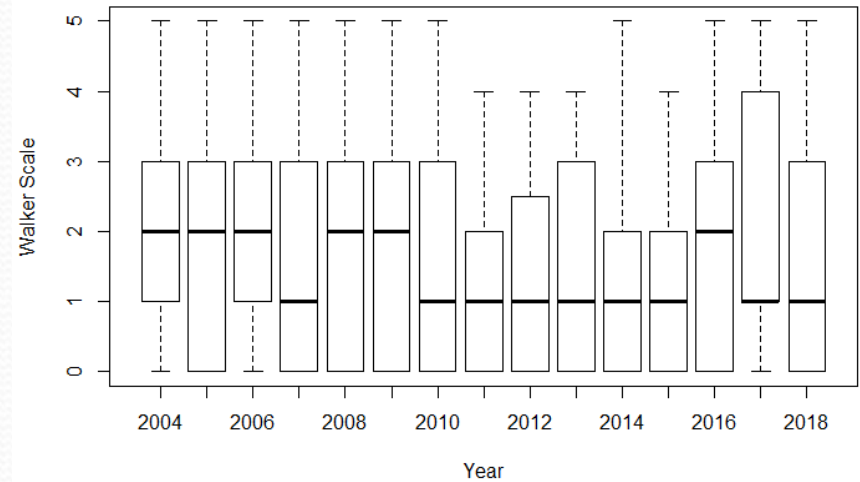
Orange County 2004-2018



San Diego County 2004-2018



Los Angeles County 2004-2018



Decline in runs is consistent even at beaches known to hold large runs

White: small, W0-1

Grey: medium, W2-3

Black: large runs, W4-5

Coronado 2004-08



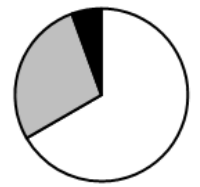
Coronado 2014-18



La Jolla 2004-08



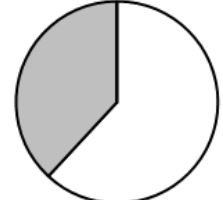
La Jolla 2014-18



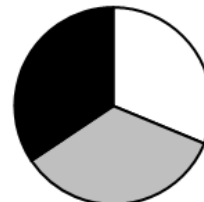
Oceanside 2004-08



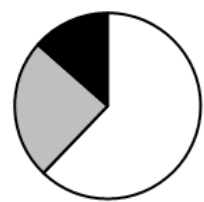
Oceanside 2014-18



Cabrillo 2004-08



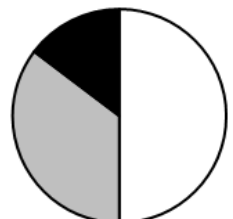
Cabrillo 2014-18



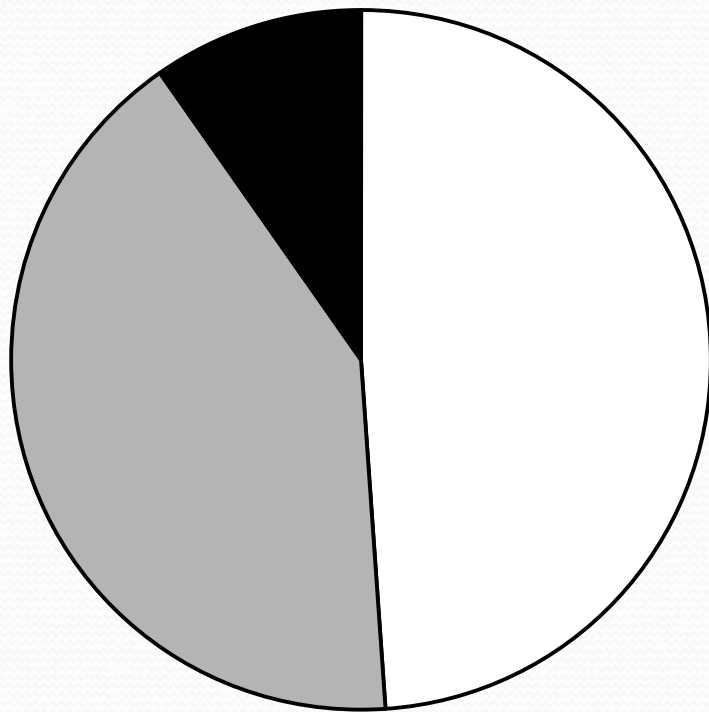
Surfrider 2004-08



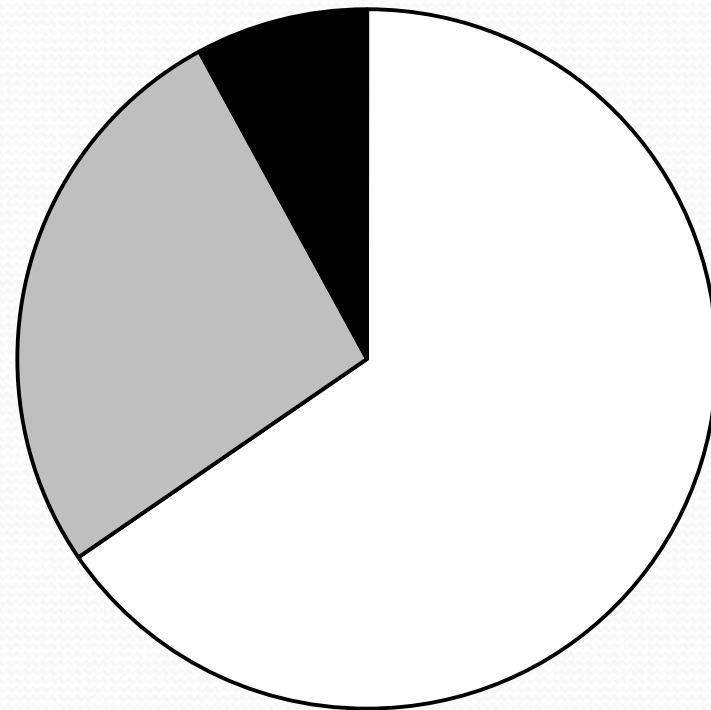
Surfrider 2014-18



Comparison across decades: significantly more small runs, fewer medium and large runs, suggests lower reproductive output.



2004-08



2014-18

□ small
■ medium
■ large

Poaching (out of season, or using gear in season, or without a fishing license)

In general: poaching in about 20% of reports in Closed Season

Hunting is reported in 93% of observations in Open Season

Regulations are rarely enforced late at night when runs occur.



Grunion spawning zone is small



- Clutches of eggs are buried in a band no more than 3 m wide parallel to shore on busy recreational beaches
- Yes, this is a grunion beach during spawning season.

Northern Grunion are smaller, spawn later,
and produce fewer eggs → more vulnerable



Malibu grunion (L)
northern grunion (R)



What actions are needed?

- We recommend changes for the recreational fishery
 - Amend 27.60(b); no **bag limit**, to 27.60(a), limit 10;
 - Section 28.00, **seasonal closure**, south of Pt. Conception restore June closure, 7/1 – 3/31.
 - Section 28.00 north of Pt. Conception: **later closure**, may be taken 9/1 – 3/31.



Photo: Bill Hootkins, 2004

Grunion Greeters THANK YOU FOR YOUR HELP!!!

We encourage
“Observe and Conserve,”
or “Catch and Release”
so that future generations will be
able to marvel at this unique,
charismatic species.


See www.Grunion.org for more





Contribution to the Themed Section: 'Marine recreational fisheries - current state and future opportunities'

Population trends of beach-spawning California grunion *Leuresthes tenuis* monitored by citizen scientists

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California Grunion *Leuresthes tenuis* (Atherinopsidae), an indigenous endemic marine fish, makes spectacular midnight spawning runs onto sandy beaches on the Pacific coast of California and Baja California. In a unique recreational fishery, people capture the fish out of water with bare hands. Grunion hunters are not required to report their catch, and there is no bag limit. California Grunion rarely appear in trawls and do not take a hook, so population status for this species is impossible to obtain by traditional fishery methods. With citizen scientists, the "Grunion Greeters," we monitored spawning runs along most of their habitat range. California Grunion recently underwent a northward range extension, but runs appear to be declining broadly across the core habitat. Noisy activities of recreational grunion hunters on shore disrupt spawning runs, preventing fish from reproducing before capture. *Leuresthes tenuis* has been identified as a Key Indicator Species for the South and Central regions of California Marine Protected Areas, and as an indicator species for climate change on beaches. Gear restrictions, license requirements, and a two-month closed season are rarely enforced late at night. We recommend continued monitoring for *L. tenuis* in California and increased protections for this unique charismatic fish.

Keywords: beach-spawning, citizen science, closed season, endemic species, Atherinopsidae, fishing gear, poaching, recreational fishery, reproduction, spawning run, spawning aggregations.

Introduction

California Grunion *Leuresthes tenuis* (Atherinopsidae) is an indigenous endemic marine fish on the Pacific coast of California. Famous for forming large assemblages that lead to massive runs, individual fish emerge fully out of waves onto beach sand to spawn (Martin, 2015). Runs may last for over an hour following full or new moons in spring and summer, and fish may cover the beach along the water line (see [Supplementary Material](#)). In the traditional habitat range of southern California, between Pt. Conception, California and Punto Abreojos, Mexico, spawning season starts in March and may extend into August, peaking between April and June (Clark, 1938; Walker, 1952).

Females dig into the soft wet sand to deposit 1500–3000 eggs while surrounded by males providing milt for external fertilization. Males do not dig into the sand, and may outnumber females by 10 to 1 during the run. Multiple paternity of clutches is typical (Byrne and Avise, 2009), and each male may repeatedly return to shore during a single night's run (Walker, 1949), providing milt for multiple females with a muscular genital papilla (Aryafar *et al.*, 2019). Thus, multiple waves may carry hundreds of the same individuals over and over again. Females spawn once during a series but can spawn multiple times across the season (Clark, 1925; Walker, 1949). The number of fish on shore cannot be easily counted during a large run, but the density, duration, and

extent of the fish are far greater during some runs than others (Walker, 1949; Martin *et al.*, 2007).

Leuresthes tenuis is targeted by a unique recreational fishery, solely during these spawning runs (Spratt, 1986; Sandrozinski, 2013). Because of their unusual life cycle, California Grunion are particularly vulnerable to overharvest. Less than 10 years after the first published scientific description of their spawning behaviour (Barnhart, 1918; Thompson, 1919), the first regulations to protect them were enacted in 1927 (Clark, 1926, 1938) by the California Department of Fish and Game (now Wildlife), CDFW. At that time, people would line the shore and capture hundreds of grunion with improvised nets made of bed sheets (Andrew Olson, pers. comm.). Early protections included a closure with no take from April to June, the peak of the spawning season, and gear restrictions that specify no gear at all. Only bare hands were (and are) allowed for capturing the fish, presumably to give them a sporting chance while on shore. Those under the age of 16 did not (and still do not) need a fishing license to catch grunion during the open season.

Walker (1949) observed grunion runs on Scripps Beach directly following World War II. On the basis of his recommendations, CDFW reduced the closed season to just April and May. Gear restrictions and license requirements remain in place. At that time California's population was substantially smaller, around 10 million, than it is today, with >35 million people living along one of the most extensively populated and urbanized coasts in the world.

During open season there is no bag limit and no requirement to report catch of this species. No commercial use of the species is permitted. Some anglers catch this species for bait, some people catch these small fish to consume whole, but most of those capturing the grunion report they are doing so for the sport, not for any particular use but because it is part of popular culture.

In reality, regulations are rarely enforced, in part because spawning runs always occur in the dark of night. Although this endemic species enjoys some unique protections, regulations have not been changed since 1949.

California Grunion runs are highlighted in public education programs of coastal public aquariums and California State Beaches, and for youth organizations such as the Boy Scouts. Because runs follow the highest spring tides of full or new moons, likely nights and times can be predicted with some success (Walker, 1952; Spratt, 1986). Especially during closed season, observation of runs can be dazzling, with thousands of fish moving out onto shore from waves for an hour or more. Runs may occur when tides are suitable, within a 2-h window following the highest nightly tide in four nights after full and new moons in spring and summer. However, often on nights when runs are forecast, no grunion are seen on shore.

Sandy beaches are critical to *L. tenuis* as essential fish habitat for spawning (Robbins, 2006). However, beaches in California and worldwide are undergoing habitat loss by coastal squeeze (Defeo *et al.*, 2009; Schoeman *et al.*, 2014; Martin, 2015), with sea level rise and erosion encroaching on the beach from the seaward side, and coastal development and shoreline armouring preventing natural retreat of the beach on the landward side (Dugan *et al.*, 2008). Exacerbated by climate change and increasing human population, California is predicted to lose 31–67% of its sandy beaches by the year 2100 under current predictions of sea level rise (Vitousek *et al.*, 2017).

Because of its beach-spawning habits, *L. tenuis* has been identified as a Key Indicator Species for the South and Central regions

of California Marine Protected Area (Marine Protected Area Monitoring Action Plan, 2018), and as an indicator species for climate change on beaches in the Ventura County Coastal Resilience Plan (<https://www.vcrma.org/vc-resilient-coastal-adaptation-project>). However, monitoring for *L. tenuis* is problematic. This species has never been abundant (Gregory, 2001). *Leuresthes tenuis* is planktivorous (Higgins and Horn, 2014); this species does not take a hook. Adults are rarely caught in trawl surveys except within enclosed bays (Allen *et al.*, 2002; Martin *et al.*, 2013; Williams *et al.*, 2016). Recreational fishers are not required to report catch of this species. Thus, traditional fishery methods cannot be used for stock assessments. The only time *L. tenuis* adults can reliably be observed is during their spawning runs.

We developed a group of volunteer citizen scientists, the Grunion Greeters, to report observations of spawning runs on suitable nights all along the California Coast. This started as a way of addressing management issues on sandy beaches, particularly the ecological effects of raking or grooming of beach sand for aesthetic purposes (Martin *et al.*, 2006; Defeo *et al.*, 2009; Dugan and Hubbard, 2010). On the basis of observations and reports across the habitat range over two decades (Martin *et al.*, 2007, 2011), we have become concerned about the status of the California Grunion population as a whole. We hypothesized that this long-term dataset from Grunion Greeter observations would enable us to discern broad trends in population size of this species along its habitat range, in order to guide conservation of this endemic species.

Methods

Metric for spawning run assessment

Strength, duration, and extent of the spawning runs are assessed by a species-specific metric, the Walker Scale, developed in 1999 by the first author with Mike Schaadt and Suzanne Lawrenz-Miller of Cabrillo Marine Aquarium in San Pedro, CA (Table 1). Initially used to compare runs in Malibu with runs in San Pedro, this method was adopted for volunteers in the Grunion Greeter program starting in 2002 (Martin *et al.*, 2007, 2011). The metric was named after Boyd Walker, in honour of his research on the timing of grunion spawning runs, mainly at Scripps Beach in La Jolla, CA. Walker also relied on volunteer observers to assess runs on two nights in 1947 from multiple different beach locations (Walker, 1949), although they used a different metric than ours.

Grunion Greeters were trained in a series of short workshops from 2002 to 2018 to understand the Walker Scale categories and assess the number of fish on shore at the peak of the run, the duration of the peak of the run, and the extent of shoreline involved in the peak of the run. Greeters make other observations about the conditions during a night when a grunion run is forecast, including weather and presence of animal predators or grunion hunters. Observers use an online web portal to input their data, usually within 24 h. The data portal is open to the public, and the questionnaire includes an assessment of the experience of the observer and whether or not they attended previous training workshops. See www.Grunion.org for additional details. Grunion Greeter data focus on closed season, April and May, but also includes reports from open season before and after. Because the Greeters are volunteers, the locations and number of reports are not constant from year to year, however some beaches are more consistently observed, and may be considered sentinel beaches.

Table 1. The Walker Scale for assessment of grunion runs.

Scale	Number of Grunion on shore at the peak of the run	Duration of peak	Descriptor
W0	No fish or only a few, little or no spawning	Up to an hour	Not a run
W1	Up to 100 fish scattered over a wide area of the beach at a time, some spawning	Up to an hour	Light run
W2	100–500 fish spawning over time, many fish ashore with many of the waves	Up to an hour	Good run
W3	Hundreds of fish spawning at once on several areas of the beach, or thousands in one area	Up to an hour or more	Strong run
W4	Thousands of fish together over a broad area, little sand visible between fish at peak of run	Peak lasts minutes up to an hour	Excellent run
W5	Fish covering the beach several individuals deep, a silver lining of the surf over an extensive area, impossible to walk through run without stepping on fish	Peak spawning continues longer than 1 h	Incredible run

Boyd Walker's pioneering research on grunion provided the scientific basis for understanding the periodicity of the spawning runs in California. The Walker Scale, developed by K. Martin, M. Schaadt, and S. Lawrenz-Miller, is a way to assess the spawning run without actually counting the fish, for comparisons across space and time. Observations should start at or before the time of the highest tides on the four nights following a new or full moon, and continue for 2 h as the tide falls. The number of grunion should be assessed at the peak of the run; most runs start small but some may build up over time. At the peak of the run, how many fish are on shore at any given time? Are they on shore over a short or long period of time? Over a small area or a large extent of the beach? How long does the peak spawning aggregation last? (c) Grunion Greeters and Beach Ecology Coalition, used by permission.

Quality control for Grunion Greeter data

All data were evaluated by scientists before use in analysis. Incomplete forms or forms with no identification from the observer were discarded. Forms from dates or times that were unlikely for grunion to run, or from unclear locations were discarded. Grunion Greeters generally work in pairs to provide internal validation. If multiple observer groups on the same run gave different scores, more credence was given to a more experienced, trained observer. Multiple observers on the same run may have different scores because they observed from different locations on the shore; this was evaluated in the reports. Unusual or atypical reports for a location or time are followed up with an e-mail or phone call for additional details. Reports were verified on subsequent days by sampling for presence and density of clutches of eggs in the sand in some but not all cases.

For the purposes of this study and to avoid bias for data from certain beaches that have more frequent observations, we selected for each beach, only the highest Walker score reported from each spawning series (the four-day period following a new or full moon), from our verified data. Thus, a spawning series with few grunion on the first two nights after a full moon but a large run on the third would be represented only by the highest Walker score for that series.

Data were compared by beach location, county, and year using non-parametric statistics. Data from within the primary habitat of southern California, containing over 90% of the species population (Martin *et al.*, 2013; Martin, 2015), were analysed separately from much sparser data for the central coast that followed a northward range extension in 2002 (Roberts *et al.*, 2007; Johnson *et al.*, 2009).

Results

Since 2002, over 4500 Grunion Greeters have provided over 5000 reports. This Grunion Greeter compilation is the most complete dataset for spawning runs of this species in existence, both in terms of geographic coverage and duration of observations. Reports have come from the entire range of the species, over 50 beaches in California and Baja California, Mexico. A northern range extension for spawning runs was discovered in 2002 in San Francisco Bay (Johnson *et al.*, 2009), followed by a northward range extension to Tomales Bay in 2005 (Roberts *et al.*, 2007). Many Grunion Greeters provided multiple observations over

several years. Verified data from professional biologists using our methods to observe California Grunion as part of their monitoring efforts for coastal construction projects are also included.

Grunion Greeters reliably report the location of a run and its strength, based on both multiple independent observations of the same run, and on sporadic post-run sampling of beaches for clutches. In 445 runs with multiple observers, there is 87.6% agreement on the ranking of the Walker Scale. Even with disagreement, scores rarely differ more than one rank between observers.

The core of the habitat range is from the border of California and Mexico in San Diego County through Orange County and Los Angeles County through Malibu. From 2002 to 2010, typically the median run strength in this core area was W2, with a small percentage of the runs at W4 or W5 level (Figure 1). Large spawning runs (W4 and W5) have been seen in every year, on occasion. On a year with a low median, the number of large runs is very low as well. Although large runs still occurred in 2018, in 6 of the past 8 years, 75% of the runs have been W2 or lower in the core habitat for this endemic species.

Examining by county, runs in Los Angeles County, Orange County, and San Diego County have decreased in Walker Score over the time of the study (Figure 2). The five years 2004–2008 compared with the five years 2014–2018 show a significant decrease in the Walker Score of runs in the core habitat over time. This decline is consistent whether testing the three core counties together (Figure 1), looking within individual counties in southern California (Figure 2), or comparing across time within individual sentinel beaches (Figure 3). For the three core counties, significant differences are seen in frequencies of large and small runs between decades ($N=1952$, $X^2=18.42$, $df=5$, $p<0.01$). By county, these differences are also significant. For San Diego County, $N=742$, $X^2=11.81$, $df=5$, $p<0.037$; for Orange County, $N=500$, $X^2=78.12$, $df=5$, $p<0.0001$; and for Los Angeles County $N=465$, $X^2=18.5$, $df=5$, $p<0.01$).

Runs are highly variable in space and time. Although on a given night one beach may hold a large run, other beaches on the same night or run series may show little activity (Figure 4). The proportion of runs that are small (W0 or W1) has significantly increased over the past 15 years (Spearman Rank Correlation Coefficient $r_s=0.57$, $df=13$, $p=0.025$). For the three counties of San Diego, Orange, and Los Angeles, small runs were 48.9% of reports from five years between 2004 and 2008, and increased to

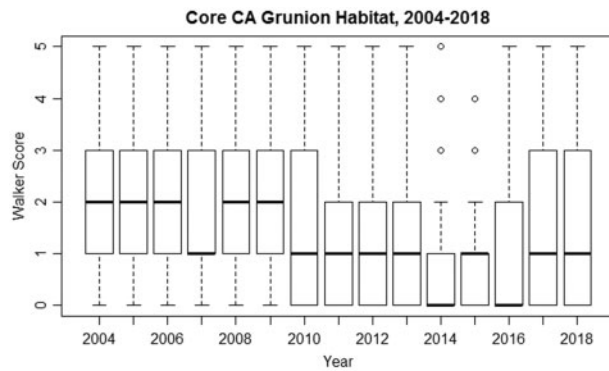


Figure 1. When the Grunion Greeters started, median (heavy bars) run size was a moderate but effective W2 in the core species habitat of southern California. Since 2010, the median of runs reported has been no higher than W1, meaning that at least 50% of the runs observed do not hold significant spawning activity. In two years (2014 and 2016) the median was W0, meaning that >50% of the time runs were predicted, few or no spawning fish were present. From 2011 to 2018, the median across the traditional habitat range typically was W1 and twice was W0. $N = 3462$.

65.4% of reports in the 5 years from 2014 to 2018. The proportion of runs at the W5 level has remained low and fairly consistent over the years, $1.58 \pm 0.76\%$ of reports in a given year.

Runs north of the core habitat seem to be increasing according to our reports, although not yet significantly (Figure 5). The areas of northward range extension around San Francisco Bay underwent local extirpation in 2008 (Martin et al., 2013) but have been re-colonized in 2014. Runs in locations in and around San Francisco Bay start later, in May rather than March, and continue into August, with the largest runs usually in July and August.

Grunion Greeters reported poaching (catching out of season, without a license, or with the use of any gear) in ~20% of reports during closed season, and hunting or poaching for 93% of reports during open season. California fishers are not required to display a license while fishing. Informal questioning indicated that many adults hunting grunion during runs did not purchase a fishing license. Game Wardens were rarely observed during runs, <5 instances out of 5133 reports. Active hunting was often accompanied by loud, raucous crowds and high disturbance and prevention of spawning (Table 2).

Clutches of eggs are buried 10–20 cm deep in beach sand in a band no >1–3 m wide parallel to shore on the upper beach in the mid to high intertidal zone. Considering a narrow strip on average ~3 m wide along 483 km of sandy beaches in southern California results in a total spawning habitat area of 1.45 km² for *L. tenuis* in its core primary habitat at the current time.

Discussion

California Grunion spawning runs can be assessed with the help of citizen scientists; in fact this may be the only way to obtain these extensive, hyperlocal data. The Walker Scale is currently used by professional resource biologists to monitor grunion runs for agencies such as US Army Corps of Engineers, California Department of Fish and Wildlife, California Coastal Commission, National Marine Fisheries Service, and California State Parks, as well as for public educational programs at Cabrillo Aquarium and Birch Aquarium at Scripps, among others (Martin et al., 2011). The Walker Scale is an effective, accurate, non-invasive

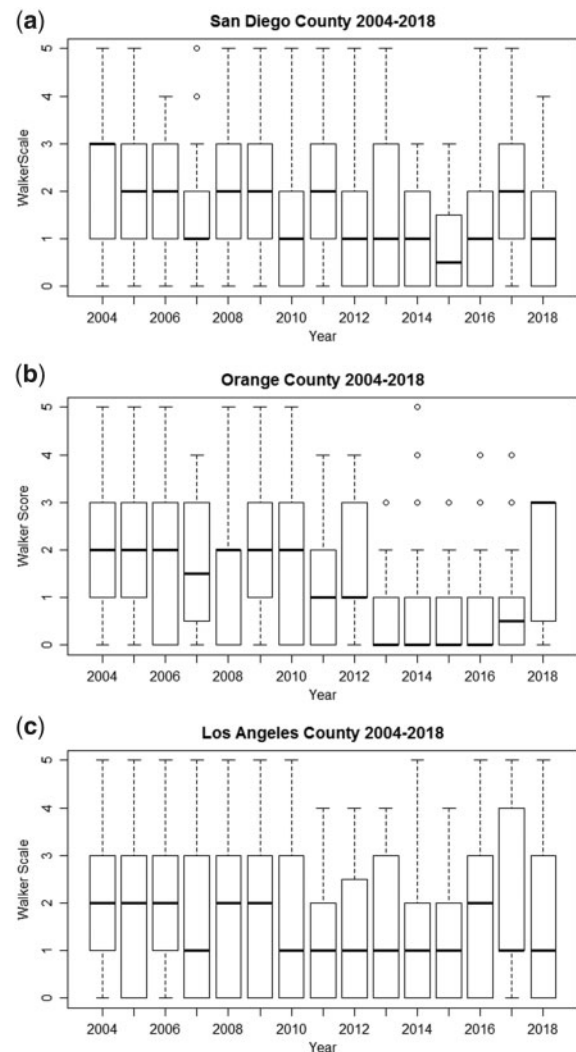


Figure 2. Reports from Grunion Greeters indicate that median (heavy bars) run size based on the Walker Scale have significantly decreased over time for each of the three southern counties. (a) San Diego, (b) Orange, and (c) Los Angeles.

although labour-intensive method for assessment of this species and other beach-spawning fishes. While the data from professional biologists monitoring grunion runs for coastal projects are certainly reliable, the number, locations, and frequency of these short-term projects are small relative to the substantial, long-term efforts of volunteer Grunion Greeters.

Even though large runs can still be observed, the median Walker Score for California Grunion spawning on shore has declined significantly across much of the core habitat range in the past ten years (Figure 1). This pattern is consistent for this endemic fish across the three coastal counties constituting its core habitat (Figure 2) and within individual beaches known historically for large spawning runs of grunion (Figure 3). The occasional presence of large spawning aggregations may create the illusion of abundance even when a population is depleted (Erisman et al., 2011). These occasional large runs may tempt resource managers to believe that these kinds of runs are both more common and more widespread geographically than is the actual situation (Figure 4, Sadovy and Domeier, 2005).

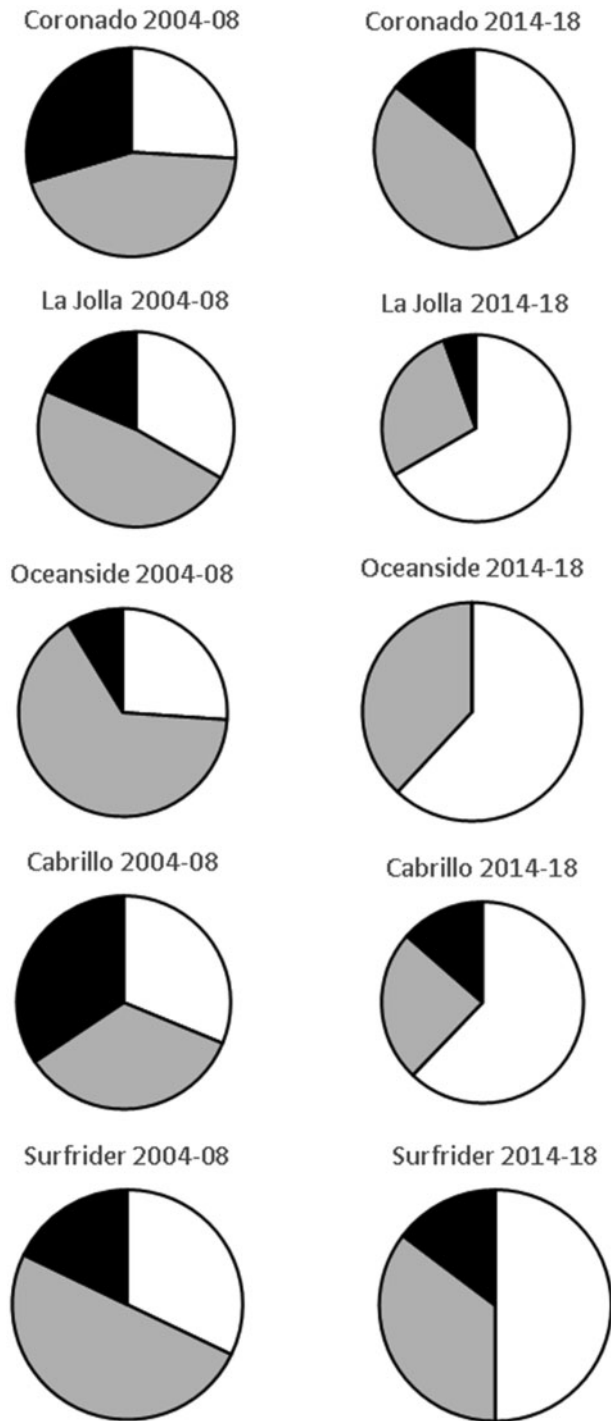


Figure 3. Proportions of runs that are small (W0 or W1), medium (W2 or W3), and large (W4 or W5) in five sentinel beaches in the core habitat range of southern California. Median runs dropped over the past decade and the likelihood of large runs decreased significantly in all cases.

On the basis of reports from Grunion Greeters and resource biologists, California Grunion appear to be both shifting their habitat range northward (Figure 5) and decreasing in numbers in the more southern habitats (Figures 1 and 2). Warming trends in ocean water and the atmosphere may be affecting this species

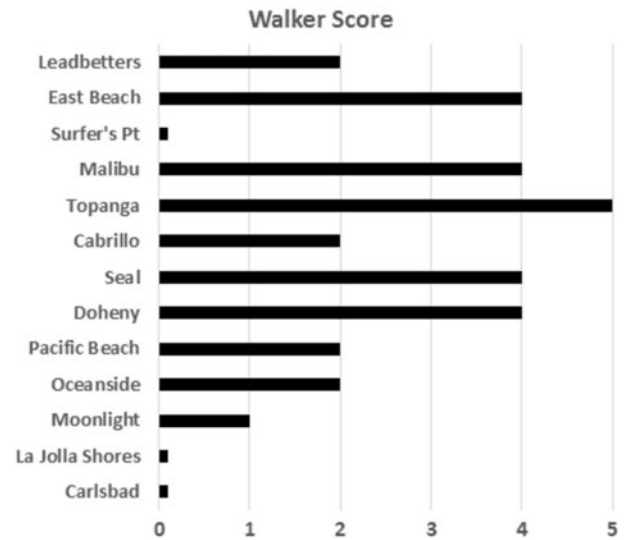


Figure 4. For one April night, beaches from San Diego, Orange, Los Angeles, Ventura, and Santa Barbara counties show the variability in run strength. The median run score is W2 for these 12 beaches.

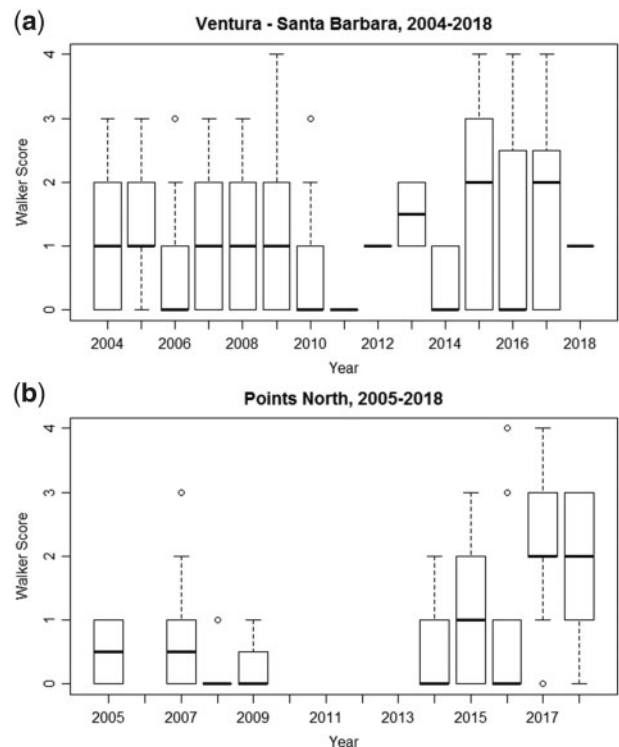


Figure 5. Runs appear to be increasing north of the core habitat range, but these differences are not significant. (a) Ventura and Santa Barbara Counties are north of the core habitat but within the traditional spawning range of *L. tenuis*. (b) *L. tenuis* colonized San Francisco Bay and points north in 2002, and then was locally extirpated by 2008. They returned in 2014 and runs are increasing in strength. Heavy line is median.

(Martin, 2015), along with ocean acidification (Tasoff and Johnson, 2019). There is an environmental component to sex determination of *L. tenuis*, so that warmer temperatures during

Table 2. Grunion Greeter reports indicate high levels of disturbance of spawning by people hunting.

“Unruly THOUSANDS, some in water, all making noise. Looked like some sort of post-apocalyptic marine Mad Max.”
“The few grunion that actually came up onto the beach were automatically grabbed by poachers. There were probably 20–30 people taking the fish last night.”
“Hundreds of people on beach, many using buckets and strainers to collect fish; informed them of regulations.” (report from a marine biologist with California Department of Fish and Wildlife).
“A large group of people gathered at least 10 plastic grocery bags full of grunion and women were walking behind them laughing and kicking the grunion. Many people were taking several hundred grunion home in trash bags.”
“Over a hundred people in a frenzy to get the few fish that came in with each wave. Lots of screaming kids, dogs, and flashlights.”
“Three families harvested hundreds.”
“One goofy guy was running wildly up and down the beach with a flashlight and grabbing at any fish that started to spawn.”
“Hunting–Splashing into water, capturing in water or at surf’s edge, noisy, yelling, screaming.”
“Lots of youngsters excited and splashing in the shallows chasing grunion. Probably they harvested 200 or 300. There were maybe 50+ in groups of 4–10 running to and fro.”
“There was a very rowdy group of ~10 people, catching and collecting the grunion during the entire run, yelling and chasing after the fish into the water, up to even waist deep!”
“Bad behavior: Kicking fish, throwing, stepping, or jumping on them.”
“TONS of people. At the first big sighting of fish the people rushed the water & the grunion fled.”
“There was a pack of ~12–14 non-English speaking people stomping on and kicking fish on the beach. One run of grunion had started and when these people behaved in this way that run went back into the water and did not return to that location.”
“Poachers continuously ignored our information very frustrating. Picking them up filling buckets and stepping on them and ripping them in half.”
“Fish tried to come ashore but a crazy mob of people lined beach with buckets & lights.”

early life result in greater proportions of males (Brown *et al.*, 2014). Of more immediate concern, their critical spawning habitat is also declining (Dugan *et al.*, 2008; Vitousek *et al.*, 2017; King *et al.*, 2018), potentially concentrating the spawning population into fewer locations on shore. The spawning zone of *L. tenuis*, the upper beach between the mid and high intertidal zone (Martin *et al.*, 2006), is also the beach area that is most vulnerable to loss by coastal squeeze (Dugan and Hubbard, 2010; Schooler *et al.*, 2017). The core spawning habitat total area of 1.45 km² for *L. tenuis* is smaller than Dodger Stadium or the Los Angeles International Airport. The minimum size is 25 km² for one Marine Protected Area (MPA) in California (Botsford *et al.*, 2014), in a network of over 100 MPAs. This critical habitat for *L. tenuis* is likely to decrease, and is already <0.001% of the area of the California MPA network.

Even though the species has managed to shift its habitat and colonize some northern bays, the northern ecotype grows to a smaller adult size, spawns less frequently, and produces significantly fewer, smaller eggs per clutch (Johnson *et al.*, 2009; Martin *et al.*, 2013). For these reasons the northern populations are more vulnerable to ecosystem perturbations and local extirpation than the populations in the traditional habitat. In addition, the more northern populations spawn on a different annual schedule than the southern populations of this species, and therefore the peak run times of the northern populations are not protected by the current closed season of April and May. These northern fish are neither different genetically (Johnson *et al.*, 2009; Byrne *et al.*, 2013) nor are they different in physiological response to temperature (Brown *et al.*, 2012) from the southern grunion, so this habitat shift appears to be restricted to areas of bays that are warmer than the waters of the open ocean.

Fished species that form spawning aggregations face an increased extinction risk (Sadovy and Erisman, 2012). Modern conservation practices almost universally protect the reproductive period and spawning aggregations of species (Hutchings, 2001). The regulations for fishing on California Grunion do the opposite by specifically targeting the spawning aggregations, striking this

species at its most vulnerable and critical time, disrupting its ability to produce the next generations. Fishing on large aggregations can mask population declines or collapse (Erisman *et al.*, 2011).

Regulations put in place to protect the endemic California Grunion during spawning runs are rarely and unevenly enforced. Poaching during closed season is common on some urban beaches, and reported during ~20% of closed season observations. Collection of spawning fish by people with or without fishing licenses is nearly universal during open season, identified in the vast majority of open season reports, disrupting runs, and preventing reproduction while removing ripe adults from the population (Table 2). Many grunion hunters do not fish for any other species, and do not possess fishing licenses. Children, not required to have a license, are very effective hunters (see Supplementary Material). Thus the potential number of people hunting California Grunion is far greater than the 2.5 million sport fishing licenses that were sold in California in 2016 (<https://www.wildlife.ca.gov/Licensing/Statistics#SportFishingLicenses>).

Data from entrainment surveys are the only other long term dataset available for *L. tenuis*. The entrainment data conforms with CalCOFI nearshore trawl data pattern (Miller and McGowan, 2013). For California Grunion, usually less than one, or fewer than two individuals are seen per million cubic meter flow (E. Miller, pers. comm.). Compared with other local silverside fishes, for Topsmelt *Atherinops affinis* 14.6, and Jacksmelt *Atherinopsis californiensis* 39.4 are present per million cubic meters flow at a peak. Both *A. affinis* and *A. californiensis* are fished commercially and recreationally, with hundreds of thousands landed each year (Vejar, 2013). These fishery-independent surveys indicate at a minimum that *L. tenuis* abundance is substantially lower than its sister silverside species of similar size.

Trawl surveys of San Diego Bay (Williams *et al.*, 2016) and San Francisco Bay (Johnson *et al.*, 2009) show large population fluctuations from year to year. In 2016 Williams *et al.* suggested a stock estimate for *L. tenuis* in San Diego Bay of 785,183 fish, but 92% were juveniles in surveys taken during the spawning season. This suggests substantially fewer, only 62,815 adult grunion in

San Diego Bay in 2016. The human population of San Diego's metropolitan area is 3.1 million, <http://worldpopulationreview.com/us-cities/san-diego-population/> not including the city's 35 million tourist visitors per year (<https://www.sandiego.org/about.aspx>).

Because of the tendency of this species to aggregate, we hypothesize that even if fewer fish are present in the total population, large runs will still occur on occasion. Our observations suggest that it is likely that a minimum number of fish must be present for a spawning run to occur. Runs with fewer than a hundred individuals usually do not include spawning events or egg deposition. Therefore the presence of only small numbers of fish during a run suggests unsuccessful reproduction. As runs decline, fewer observations can be made. If the population declines, fewer locations will hold runs, and those runs will occur less frequently. The consistent pattern of decline in median run size is of great concern for this endemic indigenous species. We suggest it is possible that the numbers of adult fish could drop too low for successful spawning even when some members of the species are present and ripe.

The sister species, *Leuresthes sardina* the Gulf Grunion, is endemic to the northern Gulf of California (Bernardi *et al.*, 2003). This species shares the beach-spawning habits of *L. tenuis* (Thomson and Muench, 1976). *Leuresthes sardina* appears on the IUCN Red List as "Near Threatened" because of potential habitat loss and human interference (Findley *et al.*, 2010). The California Grunion *L. tenuis* may face even greater threats because of larger human populations and more coastal development in California compared with Mexico.

In summary, large spawning runs still occur for *L. tenuis*, but smaller runs have been much more common in the present decade than in the previous one in its core habitat range. There may be fewer California Grunion, or the fish may not be able to spawn as frequently as in the past. Either way, reproductive output appears to be lower. For those populations that have moved north, the shift in habitat comes at the cost of smaller size and reduced clutch size, as well as a shift in spawning season that is shorter and holds less frequent spawning.

We strongly encourage increased protection of the spectacular spawning runs for this charismatic indigenous endemic marine fish. Its status as a managed species and an indicator species for climate change warrant greater concern. At minimum, a return to closed season from April to June, as originally designated in 1927, would help protect the southern population from fishing pressure. We recommend that the *L. tenuis* population on the central coast, in Monterey Bay and around San Francisco Bay, should be completely closed to take, as the populations there appear to be too small to withstand any fishing pressure.

Outreach with the Grunion Greeters may help shift public perception of this species and their interaction with its runs. Greeters report with dismay that those hunting *L. tenuis* during its spawning runs exploit the vulnerability of these fish when out of water (Table 2). Unlike typical fishers who respectfully interact with the resource and take no more than they will use, grunion hunters often say they are following some sort of (perhaps misguided) cultural tradition. They scream and yell while running to wildly chase the fish that are trying to spawn. They sometimes step on the fish in their haste, breaking their backs; then toss them into buckets to expire. Instead, we hope that more and more people will come to quietly observe the run spectacle on its own terms, without disturbing the fish, as watchable wildlife. All should be

able to simply enjoy the amazing sight of California's original surfers dancing on the beach.

Supplementary data

Supplementary material is available at the ICESJMS online version of the manuscript.

Acknowledgements

We are thankful for funding from US Fish & Wildlife Service, "Connecting People with Nature," California Coastal Commission Whale Tail Program WT-13-22, National Science Foundation DBI 1062721, National Science Foundation, REU-1560352, USC Sea Grant College – Urban Oceans Program NOAA – NA14OAR4170089/Subaward 6094463, National Marine Fisheries Service, Southwest Region, Habitat Conservation Division Contract 8-819, National Geographic Society CRE 8105-07, and Pepperdine University. We are grateful to thousands of Grunion Greeters for their long walks on moonlit beaches. RD Martin provided helpful comments on the manuscript and C Davis, T Furlong, and M Perrault assisted with analyses.

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Handling editor: Howard Browman

Memorandum

2020 JAN 24 AM 11:00

Date: January 23, 2020

To: Melissa Miller-Henson
Executive Director
Fish and Game Commission

From: Charlton H. Bonham
Director



Subject: **Petition #2019-012: Water Pumps and Clams**

A petition submitted by Mr. Carl Vogler to the Fish and Game Commission (Commission) proposes to prohibit the use of hand operated water pumps to take gaper and other clams. The California Department of Fish and Wildlife (Department) has reviewed the petition and finds that the proposed regulatory changes may help ensure the sustainable harvest of clams. The recent introduction of water pumps to take clams enables take in areas that were previously not accessible, creates efficiencies that may jeopardize the sustainable harvest of the resource, and may introduce new and expanded habitat impacts. In addition, the use of water pumps introduces enforcement concerns because the gear allows clamming activity to occur underwater and out of view, making it for difficult to enforce take limits and high grading for larger clams.

While the Department does not currently have the capacity to undertake this rulemaking due to other higher priority tasks, it supports the Commission's approval of this petition and direction to its staff to lead the development of a regulatory package.

Please direct further questions to Dr. Craig Shuman, Marine Regional Manager, at (916) 445-6459 or by email at Craig.Shuman@Wildlife.ca.gov.

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Melissa Miller-Henson, Executive Director
California Fish and Game Commission
January 23, 2020
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Memorandum

2020 JAN -9 PM 2:35

Date: January 8, 2020

To: Melissa Miller-Henson
Executive Director
Fish and Game Commission

From: Charlton H. Bonham
Director

**Subject: Petition to Change Bag Limit and Seasonal Closure of California Grunion
(Tracking Number: 2019-14)**

A petition submitted by Dr. Karen Martin to the Fish and Game Commission (Commission) proposes to amend Section 27.60(b) and Section 28.00, Title 14, California Code of Regulations. The proposed changes are to create a 10 fish bag limit for California Grunion (Grunion), and to change the open season to July 1 – March 31 south of Pt. Conception, and September 1 – March 31 north of Pt. Conception. The rationale provided by Dr. Martin states Grunion are vulnerable to overharvest and habitat loss due to their unusual life cycle.

Grunion are an iconic and endemic species to California. They have a unique spawning strategy by beaching themselves at night during the four high tides following a full and new moon from February through September. During these spawning runs, the female's half bury themselves in the sand while the males curl around them releasing milt to fertilize the eggs before both return to the ocean. These predictable runs have become a cultural event in southern California sometimes drawing large numbers of individuals to observe this unique behavior and/or recreationally harvest grunion as they come ashore.

There is no commercial fishery for Grunion and a recreational bag limit has not been established. In 1927, a seasonal closure of April 1 through June 30 was enacted due to signs of a depleting population. This seasonal closure was amended in 1947 to reduce the closure to April 1 through May 31 due to signs of a recovering population. This seasonal closure is still in effect today, which protects the peak of the spawning period.

The Department of Fish and Wildlife (Department) has very limited data on Grunion since they are not frequently caught using traditional fishery methods (e.g. hook-and-line, trawling, etc.) and are difficult to monitor due to their unique life cycle. The only abundance data available are from a group of citizen scientists, the Grunion Greeters, who monitor Grunion runs along the southern California coastline.

Melissa Miller-Henson, Executive Director
Fish and Game Commission
January 8, 2020
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Over the past 15 years, their data show a decline in the frequency and numbers of Grunion in those runs. Additionally, Grunion are vulnerable to spawning habitat loss due to sea-level rise, beach erosion, and coastal development.

As outlined in the 2018 Master Plan for Fisheries scaled-management framework, the Department proposes to prepare an Enhanced Status Report (ESR) for Grunion in early 2020. The ESR will compile available information on the species, fishery, current management and monitoring efforts, and will help inform future management needs. The Department agrees the existing management measures for the Grunion fishery may need to be adjusted to address specific overharvest and habitat loss concerns. Once evaluated through the scaled-management framework, the Department proposes to provide an update to the Marine Resources Committee in July 2020 in San Clemente, CA to discuss possible regulatory amendments.

cc: California Department of Fish and Wildlife

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Tracking Number: (_____)

To request a change to regulations under the authority of the California Fish and Game Commission (Commission), you are required to submit this completed form to: California Fish and Game Commission, 1416 Ninth Street, Suite 1320, Sacramento, CA 95814 or via email to FGC@fgc.ca.gov. Note: This form is not intended for listing petitions for threatened or endangered species (see Section 670.1 of Title 14).

Incomplete forms will not be accepted. A petition is incomplete if it is not submitted on this form or fails to contain necessary information in each of the required categories listed on this form (Section I). A petition will be rejected if it does not pertain to issues under the Commission's authority. A petition may be denied if any petition requesting a functionally equivalent regulation change was considered within the previous 12 months and no information or data is being submitted beyond what was previously submitted. If you need help with this form, please contact Commission staff at (916) 653-4899 or FGC@fgc.ca.gov.

SECTION I: Required Information.

Please be succinct. Responses for Section I should not exceed five pages

1. **Person or organization requesting the change (Required)**
Name of primary contact person: Karen Martin, PhD
Address: 24255 Pacific Coast Highway, Malibu, CA 90263-4321
Telephone number: 310-506-4808
Email address: karen.martin@pepperdine.edu
2. **Rulemaking Authority (Required)** - Reference to the statutory or constitutional authority of the Commission to take the action requested: **Fish and Game Code Section 8381**; Section 28.00 cites sections 200, 202 205, 210, 219, and 220 of the Fish and Game Code. Section 200 is relevant as this is not a commercial take. Section 202 was repealed Stats 2016. Section 205 is relevant as it allows the Commission to change or abolish an open season and to establish or change a bag limit. Section 210 is repealed Stats 2016. Section 219 is relevant as it provides the Commission authority to act to protect fish, wildlife, and natural resources. Section 220 is repealed Stats 2016.
3. **Overview (Required)** - Summarize the proposed changes to regulations: 1) Change the bag limit from "none" to "ten of one species" for California Grunion *Leuresthes tenuis*; 2) Reduce the length of the seasonal closure for California Grunion; 3) Shift the timing of the seasonal closure north of Pt. Conception for California Grunion.
4. **Rationale (Required)** - Describe the problem and the reason for the proposed change: See Attached for full text: Rationale for request for change in regulations: Unique Species Targeted During Critical Reproductive Season in a Shrinking Habitat

SECTION II: Optional Information

5. **Date of Petition: June 2019**



6. Category of Proposed Change

- ☒ Sport Fishing
☐ Commercial Fishing
☐ Hunting
☐ Other, please specify: [Click here to enter text.](#)

7. The proposal is to: *(To determine section number(s), see current year regulation booklet or <https://govt.westlaw.com/calregs>)*

- ☐ Amend Title 14 Section(s): 27.60(b); no bag limit, to 27.60 (a), limit of 10 for one species; Section 28.00, seasonal closure, may be taken June 1 – March 31; change to July 1 – March 31 south of Pt. Conception. North of Pt. Conception, seasonal closure, change so may be taken September 1 – March 31. Section 28.00 cites sections 200, 202 205, 210, 219, and 220 of the Fish and Game Code. Section 200 is relevant as this is not a commercial take. Section 202 was repealed Stats 2016. Section 205 is relevant as it allows the Commission to change or abolish an open season and to establish or change a bag limit. Section 210 is repealed Stats 2016. Section 219 is relevant as it provides the Commission authority to act to protect fish, wildlife, and natural resources. Section 220 is repealed Stats 2016.
☐ Add New Title 14 Section(s): [Click here to enter text.](#)
☐ Repeal Title 14 Section(s): [Click here to enter text.](#)

8. If the proposal is related to a previously submitted petition that was rejected, specify the tracking number of the previously submitted petition [Click here to enter text.](#)
Or ☒ Not applicable.

9. Effective date: If applicable, identify the desired effective date of the regulation.
If the proposed change requires immediate implementation, explain the nature of the emergency: April 2020

10. Supporting documentation: Identify and attach to the petition any information supporting the proposal including data, reports and other documents: Powerpoint about California grunion, scientific journal article on population trends of California grunion .

11. Economic or Fiscal Impacts: Identify any known impacts of the proposed regulation change on revenues to the California Department of Fish and Wildlife, individuals, businesses, jobs, other state agencies, local agencies, schools, or housing: There is no commercial fishery and it is illegal to sell recreational catch. No gear is legal for this species. It is unlikely that there will be negative economic impacts from reduced recreational fishing. It is possible that improved grunion runs will attract tourism for wildlife watching during the expanded closed season. Tourism agencies in coastal cities currently list grunion runs as an attraction.

12. Forms: If applicable, list any forms to be created, amended or repealed:
[Click here to enter text.](#)

SECTION 3: FGC Staff Only

Date received: [Click here to enter text.](#)



FGC staff action:

- ☐ Accept - complete
- ☐ Reject - incomplete
- ☐ Reject - outside scope of FGC authority

Tracking Number

Date petitioner was notified of receipt of petition and pending action: _____

Meeting date for FGC consideration: _____

FGC action:

- ☐ Denied by FGC
- ☐ Denied - same as petition _____
- ☐ Granted for consideration of regulation change

Tracking Number

Rationale for request for change in regulations: Unique Species Targeted During Critical Reproductive Season in a Shrinking Habitat

Life History and Current Regulations:

California grunion *Leuresthes tenuis* (Atherinopsidae), indigenous endemic marine fish, emerge out of water onto sandy beaches on the Pacific coast of California and Baja California to reproduce (Gregory, 2001). In a unique recreational fishery, people capture these fish out of water with bare hands during their midnight spawning runs (Spratt, 1986; Sandrozinski, 2013).

Because of their unusual life cycle, California Grunion are particularly vulnerable to overharvest. Less than 10 years after the first published scientific description of their spawning behavior (Barnhart, 1918; Thompson, 1919), the first regulations to protect them were enacted in 1927 (Clark, 1926, 1938) by the California Department of Fish and Game (now Wildlife), CDFW. At that time, people would line the shore, capturing hundreds of grunion with improvised nets made of bed sheets (Andrew Olson, Jr., personal communication), using them for food and fertilizer.

Early protections included a seasonal closure, with no take from April through June, the peak of the spawning season. Gear restrictions specify no gear at all; only bare hands are allowed for capturing these fish, presumably to give them a sporting chance while on shore. Under the age of 16, children do not need a fishing license to catch grunion during open season. No commercial use of the species is permitted. However, there is no bag limit, and no requirement to report recreational catch of this species.

Walker (1949) observed grunion runs on Scripps Beach directly following World War II. Based on his recommendations, CDFW shortened the seasonal closure to April and May. Gear restrictions and license requirements remained in place. At that time California's population was substantially smaller, 10 million. Today, more than 35 million people live along one of the most densely populated coasts in the world, and millions more visit as tourists.

Sandy beaches are critical to California grunion as Essential Fish Habitat for spawning (Robbins 2006). However, beaches in California and worldwide are losing habitat by coastal squeeze (Defeo et al., 2009; Shoeman et al., 2014; Martin, 2015), with sea level rise and erosion encroaching on the beach from the seaward side, and coastal development and seawalls preventing natural retreat of the beach on the landward side (Dugan et al., 2008). Exacerbated by climate change and increasing human population, California is predicted to lose 31 to 67% of its sandy beaches by the year 2100 under current predictions of sea level rise (Vitousek et al., 2017).

Current uses of California Grunion:

Some anglers catch this species for bait, some people catch these small fish to consume whole, but most of those capturing the grunion report they are doing so for the sport, not for any specific use but because hunting them is part of popular culture.

California Grunion runs are highlighted in public education programs of public aquariums and California State Beaches, and for youth organizations such as the Boy Scouts. Because runs follow the highest spring tides of full or new moons, likely nights and times can be forecast (Walker, 1952; Spratt, 1986). Runs can be dazzling, with thousands of fish moving out of waves onto shore for an hour or more.

Because of its beach-spawning habits, California Grunion has been identified as a Key Indicator Species for the South and Central regions of California Marine Protected Area (Marine Protected

Area Monitoring Action Plan, 2018), and as an indicator species for climate change on beaches in the Ventura County Coastal Resilience Plan (<https://www.vcrma.org/vc-resilient-coastal-adaptation-project>).

Population status of California Grunion:

Traditional fishery methods cannot be used for stock assessments of California grunion. This species has never been abundant (Gregory, 2001). It is planktivorous (Higgins and Horn, 2014) and does not take a hook. Adults are rarely caught in trawl surveys except within enclosed bays (Allen et al., 2002; Martin et al., 2013; Williams et al., 2016). The only time California grunion can reliably be observed is during their spawning runs.

Runs may occur when tides are suitable, within a two-hour window following the highest nightly tide in four nights after full and new moons in spring and summer. However, often on nights when runs are forecast, no grunion are seen on shore (Martin et al., 2019).

Volunteer citizen scientists, the Grunion Greeters, report observations of spawning runs on beaches all along the California Coast. With reports across the habitat range over two decades (Martin et al., 2007, 2011), this long-term dataset can discern broad trends in population, in order to guide conservation of this endemic species. Grunion Greeters assess the number of fish on shore, the length of shoreline involved, and the duration of the spawning run at its peak with a metric, the Walker Scale, which ranges from W0 (no fish) to W5 (fish covering the shore).

Over 4500 Grunion Greeters have provided over 5000 reports in the past two decades. This compilation is the most complete dataset for this species in existence, both in terms of geographic coverage and duration of observations. Reports come from the entire habitat range, over 50 beaches in California and Baja California, Mexico. A range extension for spawning runs was discovered in 2002 in San Francisco Bay (Johnson et al., 2009), followed by a northward range extension to Tomales Bay in 2005 (Roberts et al., 2007).

Concerns raised by reports from Grunion Greeters:

Large spawning runs still occur, but smaller grunion runs are much more common than in past. Spawning on shore has declined significantly across much of the habitat range in the past fifteen years. This pattern is consistent for this endemic fish across the three coastal counties constituting its core habitat (San Diego, Orange, and Los Angeles), and also on individual beaches known historically for large grunion runs (Martin et al., 2019).

California grunion appear to be shifting habitat range northward to some extent (Martin et al. 2013; Martin et al., 2019). The shift in habitat comes at the cost of smaller adult size and reduced number of eggs, as well as a shorter spawning season (Johnson et al., 2009).

Noisy activities of recreational grunion hunters on shore disrupt spawning runs, preventing fish from reproducing before capture. Poaching during closed season is common on some urban beaches, reported in about 20% of closed season observations. Collection of spawning fish is nearly universal during open season, identified in 90% of open season reports, disrupting runs and preventing reproduction while removing ripe adults from the population (Martin et al., 2019). Regulations are rarely and unevenly enforced, in part because spawning runs always occur in the dark of night.

Many grunion hunters do not fish for any other species, and do not possess fishing licenses. Thus the potential number of people hunting California Grunion is far greater than the 2.5 million sport fishing licenses that were sold in California in 2016.

The occasional presence of large spawning aggregations may create the illusion of abundance even when a population is depleted (Erisman et al., 2011). Occasional large runs may tempt resource managers to believe that these kinds of runs are both more common and more widespread geographically than is the actual situation (Sadovy and Domeier, 2005).

We suggest it is possible that the numbers of adult fish could drop too low for successful spawning even when some members of the species are present and ripe. Runs with fewer than a hundred individuals usually do not include spawning events or egg deposition. Small numbers of fish in a run indicate unsuccessful reproduction. The consistent pattern of decline in median run size is of great concern for this beach-spawning species.

The sister species, the Gulf Grunion *Leuresthes sardina*, endemic to the northern Gulf of California (Bernardi et al., 2003), shares the beach-spawning habits of *L. tenuis* (Thomson and Muench, 1976). The Gulf Grunion appears on the IUCN Red List as “Near Threatened” because of potential habitat loss and human interference. (Findlay et al., 2010). Our California Grunion may face even greater threats than the Gulf Grunion because of larger human populations and more coastal development in California compared with Mexico.

Recommendations for change:

Although this managed species enjoys some unique protections, fishing regulations have not changed since 1949, while fishing pressure has increased.

We strongly encourage increased protection for this charismatic indigenous endemic marine fish.

- Section 28.00, seasonal closure, may be taken June 1 – March 31 → change seasonal closure to include June; may be taken July 1 – March 31 south of Pt. Conception. North of Pt. Conception, seasonal closure, may be taken September 1 – March 31.

Change requested: For the southern population, return seasonal closure April - June, as originally designated in 1927. For the *L. tenuis* north of Pt. Conception, shift the timing of the seasonal closure, to protect the peak season that occurs later there, closure from April – August.

- Section 27.60(b); no bag limit → change to 27.60 (a), limit of 10 for one species.

Change requested: We recommend a change from no bag limit to a limit of no more than 10 fish.

Section 28.00 cites sections 200, 202 205, 210, 219, and 220 of the Fish and Game Code. Section 200 is relevant as this is not a commercial take. Section 202 was repealed Stats 2016. Section 205 is relevant as it allows the Commission to change or abolish an open season and to establish or change a bag limit. Section 210 is repealed Stats 2016. Section 219 is relevant as it provides the Commission authority to act to protect fish, wildlife, and natural resources. Section 220 is repealed Stats 2016.

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Scott Miller
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February 8, 2020

California Fish and Game Commission
P.O. Box 944209
Sacramento, CA 94244-2090



Re: **Petition # 2019-012:** Prohibit the use of hand operated water pumps.

Dear Commissioners and Staff,

Hand operated water pumps have greatly increased the number of days clams are taken from Tomales Bay and, presumably, the number of clams taken as well.

There has been an increase in the number of vehicles/people coming to Lawson's Landing to go clamming and, more notably, a *major* increase in the number of days those vehicles/people come each year.

I've been wondering why the clammers are now coming on such high tides, as I have never seen that before. Now I know why. It's the hand pump.

The hand pump has increased the number of days clams can be taken, as well as the number of hours each day clams can be taken. The increase in hours opens up the potential for more "double-dipping" (get limits before the tide, then come back and get more limits after). These increases are not sustainable, even in the short-term.

If the Commission wants to maintain a viable clam population it could:

- A) Prohibit the use of these pumps
- B) Lower the daily bag limit
- C) Have seasonal closures
- D) Close it year-round

My recommendation:

Start with option A. If that doesn't work move on to B, then C, then D.

I applaud Mr. Vogler's commitment to *responsible* fishing and clamming, and the Lawson family's past and present commitment to protecting a valuable resource.

Save the Clams. Ban the Pumps.

Sincerely,
Scott Miller